JAN 15

FLIGHT

MAGAZINE

JANUARY 1960
50 cents

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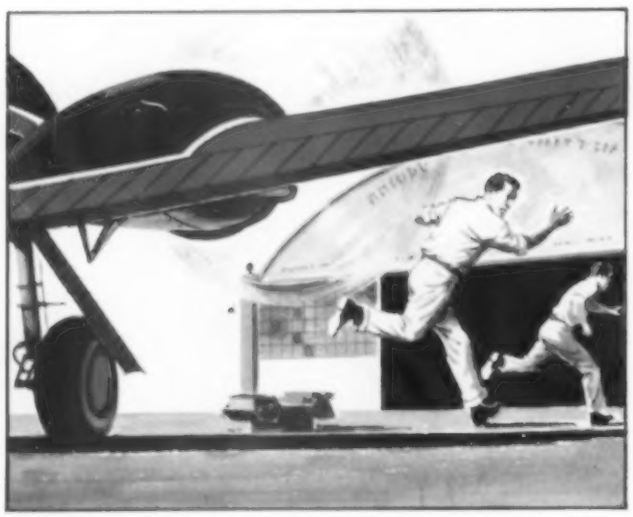
FEB 2 - 1960

MOONEY MARK 20A FOR 1960

WING TIPS

DON'T CHANCE IT. Many a hot-shot pilot *thought* he could make it! You may think you know the area like the back of your hand, but don't chance it during hazardous weather. Minimum conditions for visual or instrument approaches and flight paths were set up for your safety – follow them!

AVOID "HEADACHES". Rough weather, grabbing brakes or any crash situation will cause injury of some sort if you're not strapped in securely. Check your seat belt and shoulder harness periodically for wear and anchorage security. Wear them and avoid "headaches"!



STAY "ON THE STICK". Failure to make corrections while taxiing has been the cause of countless groundloops and nose-up accidents. Be alert all the time – wind gusts, last-minute turns, overcorrections and near misses if not handled immediately can be costly. Remember, you're still flying 'til it's parked.

REMEMBER: For "Happy Flying"... look for the famous Esso Sign from Maine to Louisiana.

ESSO PISTON AND TURBO OILS. Up there, you rely on your engine and your engine relies on an oil for proper lubrication. Esso Aviation Oils excel in high-temperature stability and help prevent piston ring gumming and harmful carbon deposit formations. Whether your plane be large or small – prop or jet – look to Esso for the best possible lubricants for your aircraft.

ESSO STANDARD OIL COMPANY

Highways or Skyways..."ESSO RESEARCH works wonders with oil"

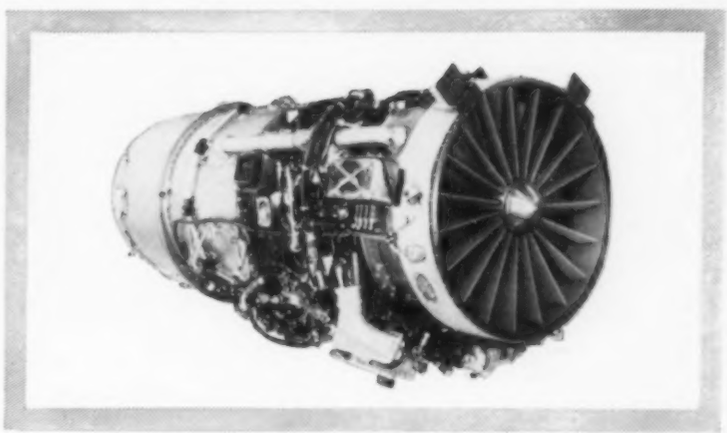
JAN 15 1960 B 813497

ROLLS-ROYCE BY-PASS JETS

are now flying in Boeing 707-420 and Douglas DC-8 jet airliners

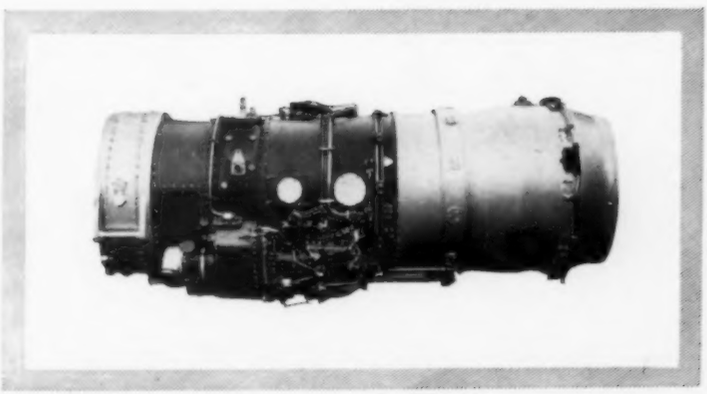
TL 501
.S665

The by-pass or turbo-fan principle proved by the Conway is now generally accepted as the correct formula for all high speed subsonic jet transports.



Conway by-pass jets for civil use will enter service in 1960 at 17,500 lb. guaranteed minimum thrust. The Civil Conway is being developed to powers over 20,000 lb. thrust with improved fuel consumption and will power the Vickers VC. 10.

The RB. 141 family of by-pass jets (10,000 lb. to 17,500 lb. thrust) have been designed to give the best possible operating economics for jet transport aircraft. The RB.141 of 14,300 lb. thrust will power later versions of the Sud-Aviation Caravelle and the RB.163 of 10,100 lb. thrust has been chosen to power the Airco DH.121.



ROLLS-ROYCE **BY-PASS JETS**

ROLLS-ROYCE OF CANADA LIMITED, BOX 1400, ST. LAURENT, MONTREAL 9, P. Q.

ROLLS-ROYCE LIMITED, DERBY, ENGLAND

AERO ENGINES • MOTOR CARS • DIESEL AND GASOLINE ENGINES • ROCKET MOTORS • NUCLEAR PROPULSION

For a 14" x 10" lithographic print, suitable for framing, write Aviation Division . . . Request Historical Series #2.

An epic air encounter . . . Major Barker, in a Snipe, engages 50 to 60 enemy planes.

Early War Birds—THE SOPWITH 7F.1 SNIPE

This British plane, the last of the rotary-powered Allied scouts produced during World War I, appeared about three months before the Armistice. Powered with a 230 h.p. Bentley B.R. 2 rotary engine, the Snipe had a top speed of 121 m.p.h. at 10,000 feet, a service ceiling of 20,000 feet, and an endurance of 3 hours. Like most rotary types, it was quick and possessed tight turning ability.

No discussion on the Snipe would be complete without mentioning Major William G. Barker and the heroic fight of this Canadian against overwhelming odds. Barker, a veteran of both the Austrian and Western Fronts, had been ordered back to England for a training command. On the morning of October 27, 1918, he took off by himself . . . having decided to combine his last offensive patrol with the flight to England. At 20,000 feet he engaged first a German two-seater and then a Fokker. He got them both . . . only to find himself surrounded by some 50 to 60 German planes. There was no choice but to fight his way out. He kept the Snipe twisting and turning . . . firing as targets came into his sights. Thousands of bullets streamed down on him, riddling the Snipe and wounding Barker in both legs and one arm. Still he fought on . . . knocking down four Fokkers. Finally he managed to get away and crash land his crippled Snipe just behind the Allied lines.

In what was one of the most outstanding exhibitions of aerial "dog-fighting" of the war, Barker had shot down four enemy aircraft with two more listed as probable. Major Barker was awarded the Victoria Cross . . . and the Snipe became the most talked about plane during the closing weeks of the war.

PHILLIPS 66

A pioneer in the development of aviation fuels, Phillips Petroleum Company is today a leading supplier of high octane gasoline for commercial, private, and military aircraft . . . and of *super-performance* jet fuels for turboprops and jets. And Phillips research continues to lead the way, developing new fuels for the aircraft of tomorrow.

AVIATION DIVISION • PHILLIPS PETROLEUM COMPANY • BARTLESVILLE, OKLAHOMA

AIR Report
Significant Trends and News

TURBOPROP EXECUTIVE TWIN AND HELICOPTER, both powered by small Boeing gas turbines, will fly early in the spring of 1960, according to Boeing, which did not identify the two experimental aircraft. Boeing has applied for FAA certification of its new Model 520 turboprop engine, with certification tests scheduled for the latter part of 1960. The 520 series turbines have delivered 500 hp. in test cell operations with a specific fuel consumption of 0.65 lbs. per brake horsepower hour. The 520 weighs 325 lbs. Boeing says it aims for production quantities in early 1961 which "will put the dollar-per-horsepower price on a competitive basis with reciprocating aircraft engines." Current production turbine at Boeing is the 240-hp. Model 502-10C.

NAVY HAS SELECTED NEW PIPER AZTEC TWIN to fill its requirement for an economical off-the-shelf utility aircraft. Piper expects Navy to enter discussions soon to arrange for procurement and support of an initial quantity of Aztecs. Selection was made after examination of detailed cost and technical proposals submitted by commercial aircraft manufacturers. New 5-place Aztec is powered by two 250-hp. Lycomings, grosses 4,800 lbs., has 205-mph. cruising speed and 144-gal. fuel capacity for range of over 1,000 miles.

MOTOROLA, INC., ACQUISITION OF LEAR EXECUTIVE AND PERSONAL AIRCRAFT RADIO PRODUCTS was under way last month in negotiations involving stock deal. Lear retains all other products.

LOCKHEED AIRCRAFT HAS ACQUIRED INTEREST IN AERONAUTICA MACCHI, prominent Italian aircraft manufacturing firm, and Macchi will be producing under license a new Lockheed-designed light utility aircraft in Italy by mid-1960. Macchi is located at Varese, 40 miles northwest of Milan, and Lockheed's "substantial portion of Macchi stock" gives the American firm a base in the new European Common Market of 6 nations.

CESSNA SALES OF $105,786,000 DURING FISCAL 1959, a new all-time high, included $46,622,838 worth of commercial aircraft sales, the latter being 22% higher than those for 1958. New figures were released last month by Dwane Wallace, president, in reporting earnings of $7.9 million, up 55% over 1958. Sales of Aircraft Radio Corp., acquired by Cessna, were $14,109,888, up 46% over 1958. Cessna's military sales dropped 17% to $34.9 million.

NEW AIR FORCE ORDER FOR CESSNA T-37B JET TRAINERS totals $9.5 million and extends T-37B production through July, 1961. New contract represents an airframe production cost reduction of over 50% since T-37 output began four years ago. Cessna is turning out the jets at a rate of one airplane every 10 hrs. 50 mins. of the working day.

BEECH SALES OF $89,539,620 DURING FISCAL 1959 included $37.9 million worth of commercial aircraft productions, up 18%. Mrs. O. A. Beech, president, reported November commercial aircraft sales totaled $6.67 million, up 100% over the same month last year.

SIGNIFICANTLY IMPROVED LIGHTPLANES AND TRANSPORTS were requested by the U. S. Army last month at a meeting attended by over 400 representatives from 137 aviation and electronic firms. "We're not interested in simply minor improvements over the aircraft we now have — we want major advancements," said Col. Robert R. Williams, chief of the air mobility division, in requesting "truly important technical breakthroughs." The firms were asked to submit results of their design studies by Feb. 1 and the Army hopes it can conduct design competitions on actual airplanes during 1960.

CHANCE VOUGHT AIRCRAFT has received a new $58 million contract from the Navy for additional

(Continued on page 76)

FLIGHT MAGAZINE

JANUARY, 1960 VOL. 49, No. 1

THIS MONTH'S COVER pictures the 1960 Mooney Mark 20A, which will be introduced at Mooney Aircraft's annual distributor-sales meeting on Jan. 27 at the factory in Kerrville, Texas. The sleek 4-place Mark 20A is powered by a 180-hp. Lycoming, features a more luxurious interior, super soundproofing, tinted windows, new instrument panel and improved brakes with a new paint design for 1960.

—(Mooney Photo by Anthony Linck.)

Air Report—SIGNIFICANT TRENDS AND NEWS 5

Just Among Ourselves—EDITORIALS: SAFETY STARTS WITH INSTRUCTOR; INVESTORS "DISCOVER" LIGHTPLANE INDUSTRY . 17

Airmen's Calendar—COMING EVENTS 18

Cessna's New 310D Twin—SWEPT TAIL AND REFINEMENTS FEATURE NEW MODEL 28

Desert Air Show—NEW BEECHCRAFTS IN PICTURESQUE SETTING . 29

Quick Tripper—BY TOM ASHLEY—CESSNA 210 DEMONSTRATES TRAVEL CAPABILITIES ON WEST COAST TRIP 30

FAA Facilities Implementation—BY JOSEPH H. TIPPETS—REPORT CITES STATUS OF PROJECTS FOR GROWING TRAFFIC . . 34

Air Service in Alaska—BY E. H. PICKERING—OPPORTUNITIES AND PROBLEMS AS VIEWED ON TOUR OF NEWEST STATE . . . 36

Gulfstream Executive Fleet Growing—TWENTY-SEVEN GRUMMAN PROPJETS DELIVERED TO CUSTOMERS FOR OUTFITTING 50

Vortex Turbulence—Unseen Killer—THIS SAFETY MESSAGE CAN SAVE YOUR LIFE 54

New Business in the Hangar—NATIONWIDE ROUNDUP OF INTERESTING DEVELOPMENTS IN BUSINESS FLYING 80

GEORGE E. HADDAWAY, Editor-Publisher; TOM ASHLEY, Managing Editor; FRED N. STONES, JR., Business Manager; LOUISE ROBERTSON, Circulation; E. H. PICKERING, Consultant; P. O. Box 750 (2700 N. Haskell Ave.), Dallas, Texas — Telephone TAylor 3-6191.

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BELL'S NEW 47G-3 TROOPER

The mighty 47G-3 easily lifts 1000 pound plus useful load off Pikes Peak during rugged twelve-day tests.

America's Highest-Flying Utility Helicopter

Here is the helicopter for high-altitude operators in forestry, construction, utility patrol and every kind of mountain work. Already a record-setter, the Pikes Peak-proven 47G-3 turns in performance never dreamed of in a low cost, three-place 'copter.

- Service ceiling in excess of 23,000 feet; cruises at 15,000 feet with 1100 pound useful load. Forward speeds up to 110 mph; rate of climb, 700 feet a minute.
- Safely makes power-off landings in thin mountain air.
- Carries big, rugged rotor system, same as world-proven Bell 47J's.
- Powered by Franklin turbo-supercharged engine.
- Flown and tested by ten veteran Charter pilots.
- Parts are interchangeable with those in existing Model 47 Bell equipment.

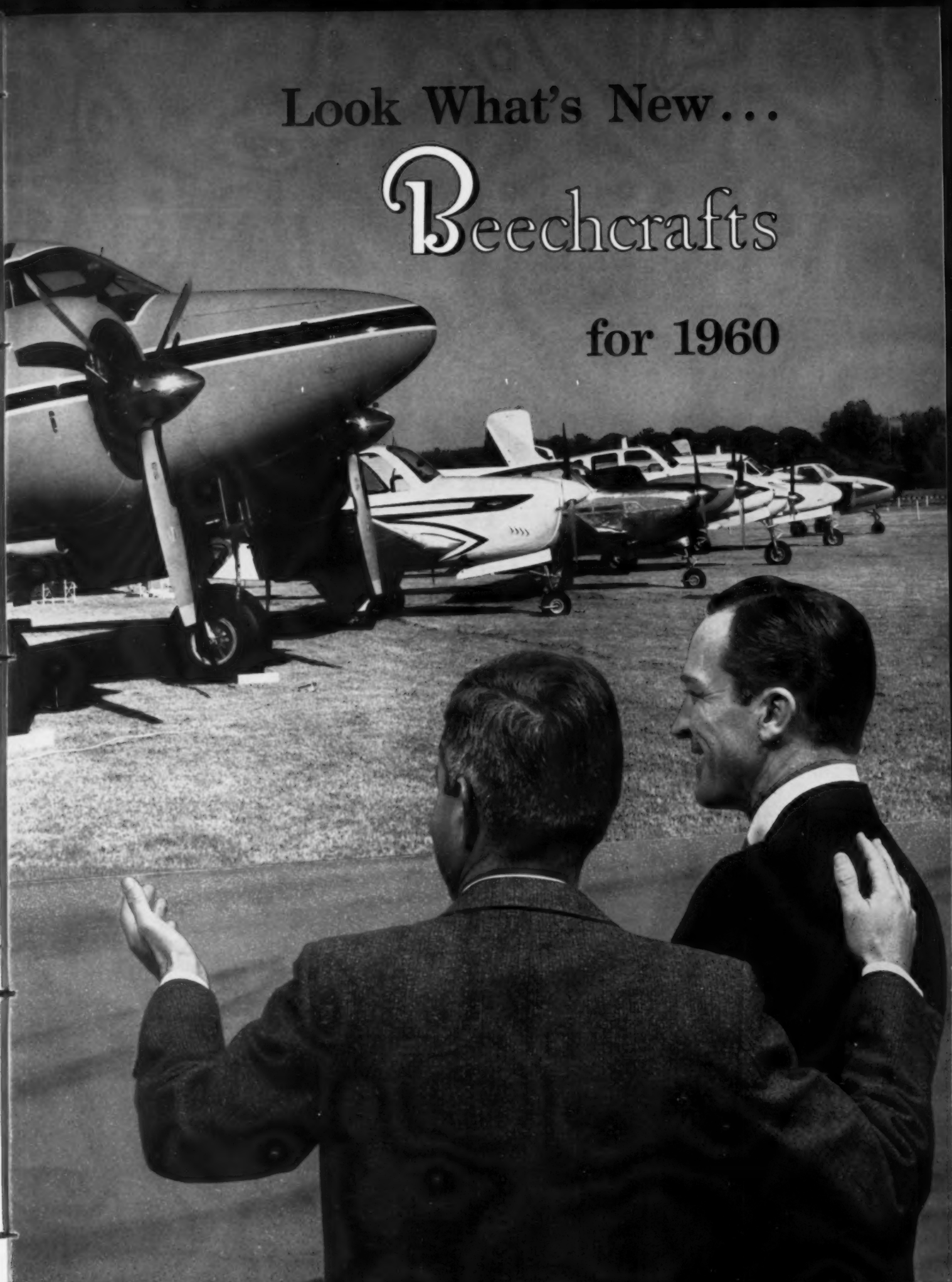
Write today for full details of this brilliant new Bell— orders for Spring, 1960 delivery are being taken now.

BELL HELICOPTER CORP. *Fort Worth, Texas • Subsidiary of Bell Aircraft Corp.*

Look What's New...

Beechcrafts

for 1960



The airplane executive pilots prefer, the Beechcraft Super G18 can deliver up to 234 mph, and fly up to 1,626 miles non-stop.

What's New for '60 in the . . . Beechcraft Super G18:

Now the world's most popular executive transport is even more advanced for 1960. A favorite with pilots and passengers alike, the Beechcraft Super G18 is the biggest, roomiest airplane with the biggest load carrying capacity of any in its class. No other airplane has been more thoroughly tested and proved. Famous for its outstanding comfort, reliability and performance, this latest version of the fabulous "Twin-Beech" brings you a host of new improvements, including these . . .

Look for this distinctive new windshield design. Behind it, you'll find the roomiest, most comfortable pilot compartment in any business airplane—and a wonderful new world of quiet flight. You'll know it's for you.

- **New, bigger, re-designed cockpit** offers greatest headroom, and legroom ever. Adjustable pilots chairs.
- **Improved visibility** with new wraparound windshield and larger cockpit side windows.
- **Modern standby rocket power.** New factory installed JATO units give you extra "boost" for short take-offs with big loads.
- **New all-weather usefulness.** The Super G18 with weather radar, modern de-icing equipment, wing ice-lights, propeller anti-icing equipment has even greater "go-anytime" capability.
- **New customized radio "packages"** installed at the factory give you a wide selection of the most modern radio and navigation equipment built—including custom radar installations.
- **New custom interiors,** finished in your choice of soft, luxurious fabrics and fine grain leathers. Separate pilot and passenger compartment, plus separate lavatory-baggage compartment. Other appointments include deep-cushioned airliner-type chairs, refreshment bar and foldaway tables.

See your Beechcraft distributor or dealer now. Or, for illustrated Super G18 brochure and free copy of "Dollars and Sense of Business Flying," write Public Relations Department, Beech Aircraft Corporation, Wichita 1, Kansas, U. S. A.

Beechcraft

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

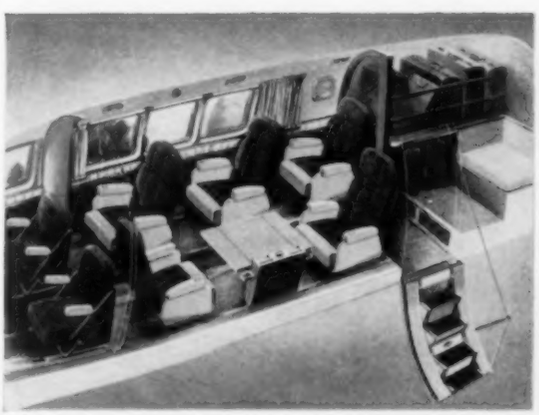
The new Beechcraft Queen Air is one of the world's easiest-to-fly airplanes. Custom equipped for all-weather performance.

What's New for '60 in the . . . Beechcraft MODEL 65 Queen Air:

Here is the only 6 to 7 seat business airplane specifically designed with the modern airliner features that America's flying business leaders told us they wanted in an executive transport. The new Beechcraft Queen Air is the only airplane in its class that combines airliner speed, comfort and convenience with the "small airplane" utility and low operating cost that modern business use demands. Here are just a few reasons that you, too, will choose the new Queen Air:

- **Large, roomy separate pilot compartment,** with sliding door privacy. Extra-large cockpit windows provide unexcelled visibility. Room for complete dual instrumentation.
- **Spacious, quiet "conference room" passenger cabin** with wider center aisle lets you walk and move about easily in flight.
- **Airliner-type "air-stair" door** for easy entry and exit.
- **Individual reclining seats,** extra wide and deep-cushioned, have modern "posture-ease" foam rubber construction. Optional arrangements include a 6½-foot couch for "stretch out" comfort.
- **Huge, shelved baggage compartment,** accessible in flight. Your bag, briefcase or dictating machine is in easy reach.
- **Airliner-type private lavatory.**
- **Nearly 4 miles a minute top speed** and custom all-weather performance. Up to 1,500 miles non-stop cruising range.
- **Big 340 h.p. supercharged fuel injection engines** give you exceptional fuel economy, power to spare up to 30,000 feet, and complete freedom from carburetor icing.

See your Beechcraft distributor or dealer now. Or, for fully illustrated Queen Air brochure and free copy of "Dollars and Sense of Business Flying," write Public Relations Department, Beech Aircraft Corporation, Wichita 1, Kansas, U. S. A.



Here is just one of many custom interior arrangements offered in the new Beechcraft Model 65 Queen Air. Optional appointments include extra chairs, adjustable lounges, food bar, coat closet and office-aloft equipment.

Beechcraft

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

With modern 340 h.p. supercharged fuel injection engines, the all-new Twin-Bonanza carries 6 at nearly 4 miles a minute in airliner comfort.

What's New for '60 in the. . . Beechcraft Twin-Bonanza:

Never before has an "old favorite" been so completely new as this big, roomy Beechcraft Twin-Bonanza for 1960. You have to see it to appreciate it!

Underneath its smart new lines, it's still the strongest, most rugged airplane in commercial aviation. And now, with a wide array of exciting new features, the Twin-Bonanza brings you a whole new world of comfort and convenience. With custom all-weather equipment, this is the "go anytime" 6-place airplane you've always wanted. Compare—and see how much more you get in the all-new Twin-Bonanza for 1960:

There's plenty of room to stretch out and move around in the spacious cabin of the new Twin-Bonanza. All interiors are custom finished in the finest fabrics and leathers. Optional seating arrangements include couches.

- **New "air-stair" door** for safe, easy entry and exit.
- **All-new spacious interiors** with a wide choice of optional seating plans, plus added headroom and center aisle roominess.
- **New baggage compartment, accessible in flight** from passenger compartment. Carpeted shelves and upholstered walls protect your bags and briefcases from scuffing.
- **New airliner-type reclining chairs** for relaxed comfort on long trips. Pilot's chair adjusts vertically, co-pilot's chair adjusts to left or right.
- **New year-round comfort control system,** with thermostatically regulated cabin temperature and optional air conditioner makes the Twin-Bonanza one of the world's most comfortable airplanes, no matter where you fly.
- **New "Eye Ease" cabin lighting system** reduces reflections and glare for easier, more relaxed night flying.
- **Advanced new de-icing system** gives extra protection against wing ice —yet weighs up to 50% less than other systems.

See your Beechcraft distributor or dealer now. Or, for fully illustrated Twin-Bonanza brochure and free copy of "Dollars and Sense of Business Flying," write Public Relations Department, Beech Aircraft Corporation, Wichita 1, Kansas, U. S. A.

Beechcraft

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

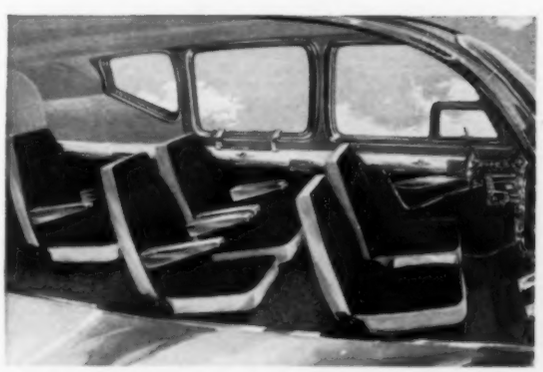
Now a 5-place plane, the new Travel Air is still the quietest, easiest-to-fly and easiest-on-gas twin in the 200 mph class.

What's New for '60 in the. . . Beechcraft Travel Air:

Now the fabulous Beechcraft Travel Air, America's quietest, easiest-to-fly light twin, moves even farther ahead. All the wonderful handling ease is still there . . . all the rugged dependability . . . the easy way it has with fuel. But now, with a long list of new features and advantages to offer you in 1960, the Travel Air is even more the outstanding business twin in its class. Here are just a few of the reasons why:

- **New! Bigger, roomier cabin** has 17 cu. ft. more space for passengers and baggage. Larger than any other twin in its class.
- **Now seats 5 big passengers** in individual deep-cushioned reclining chairs—and all passengers face forward, with plenty of headroom, hiproom and legroom. Full-size baggage compartment, too! Optional fifth seat.
- **Quietest light twin in the sky.** Even at 200 mph, the Travel Air's super-soundproofing lets you cruise in relaxing "Quiet Sealed" comfort no other twin can match.
- **A real "miser" on fuel.** Up to 11 miles per gallon—more than any other twin-engine business airplane.
- **Extra-low maintenance** cuts operating costs even more.
- **Extra-long range** lets you fly up to 1,410 miles non-stop.
- **Easiest-to-fly of any light twin**—the ideal airplane for single-engine pilots moving up to a twin.
- **New comfort control system** keeps you warm in winter, cool in summer—automatically—wherever you fly.

See your Beechcraft distributor or dealer now. Or, for illustrated Travel Air brochure and free copy of "Dollars and Sense of Business Flying," write Public Relations Department, Beech Aircraft Corporation, Wichita 1, Kansas, U. S. A.



New 5-seat interior has plenty of "stretch-out" room even for 6-footers . . . plus full size baggage compartment. Custom interiors finished in rich fabrics and leather trim in your choice of colors.

Beechcraft

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

Still away out in front with fuel injection, the Bonanza has a top speed of 210 mph and optional seating for five.

What's New for '60 in the. . . Beechcraft Bonanza:

Over 6,000 Beechcraft Bonanzas have firmly established the reputation of this distinctive airplane as the ultimate in single-engine business planes.

In flying ease, speed, luxurious quiet and comfort, strength, operating economy and low maintenance, the Bonanza has no equal. First with fuel injection, the Bonanza is still years ahead of its field in 1960.

Here are just a few of the many reasons why you, too, will acclaim the Bonanza the outstanding airplane in its class:

Compare this spacious soundproofed cabin with that of any other single-engine business airplane. Deep-cushioned individual reclining seats, foam headrests, and other refinements make every trip a genuine pleasure.

- **World's fastest** all-metal single-engine business airplane. Cruises at 200 mph with only 75% power.
- **Amazing fuel economy and longest range.** Delivers nearly 20 miles per gallon with fuel capacity for over 1,200 mile range.
- **Extra rugged construction** permits the Bonanza to be licensed in the Utility Category. You get extra load carrying ability and reduced maintenance with the Bonanza's extra-strength design.
- **More room for passengers and baggage,** with more comfort than any other single-engine business airplane.
- **High visibility low-wing design** lets you see ahead of the turn during flight maneuvers and in the pattern.
- **Tastefully appointed custom interiors** finished in your selection of new luxurious fabrics and imported leathers.
- **So easy to fly,** with coordinated controls, wide rugged tricycle landing gear and even better "hands off" stability that you won't believe it until you take the wheel yourself!

See your Beechcraft distributor or dealer now. Or, for fully illustrated Bonanza brochure and free copy of "Dollars and Sense of Business Flying," write Public Relations Department, Beech Aircraft Corporation, Wichita 1, Kansas, U. S. A.

Beechcraft

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

What's New for '60 in the. . .Beechcraft MODEL 33 Debonair:

Now you can enjoy Beechcraft performance, comfort and dependability for as little as $19,995 with the new Beechcraft Model 33 Debonair.

Now, with the new Beechcraft Debonair, Beechcraft introduces a new standard of comparison in its price class. Everything about this new airplane bears the unmistakable hallmark of Beech craftsmanship. You see it in the rugged design, in the clean "let's go" look and in the tastefully appointed, luxuriously roomy interior. Compare these and other features and you will agree the Beechcraft Debonair is the new pacesetter in the middle-priced field:

- **225 h.p. continuous-flow fuel injection engine** for "get there fast" speeds, easier starting at any temperature, more uniform fuel distribution, smoother operation, extra power and more than 17-mile-per-gallon fuel economy.
- **Cruises 185 mph with 75% power.** 195 mph top speed.
- **Flies up to 1,170 miles non-stop** on only 68 gallons of fuel.
- **Climbs at more than 1,000 feet per minute** to top weather and terrain in a hurry. 19,800 ft. service ceiling with full load.
- **Strongest, most rugged plane in its price class.** Licensed in the Utility Category.
- **Plenty of "pick up and go."** Even with full fuel tanks, it has a big 837 pound allowance for 4 passengers and baggage.
- **Larger windows and better visibility** than any other airplane in its field. High visibility low-wing design lets you see ahead of the turn in all maneuvers.
- **Wide rugged landing gear** proved by millions of landings.

Here is the one you've waited for—and so easy to fly! See your Beechcraft distributor or dealer now. Or, for Debonair brochure and "Dollars and Sense of Business Flying," write Public Relations Dept., Beech Aircraft Corporation, Wichita 1, Kansas, U. S. A.

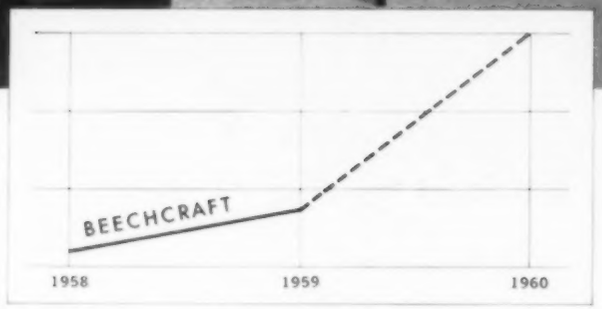
Relax in famous Beechcraft comfort in wide, posture-contoured seats. Deep-textured wall-to-wall carpeting, super soundproofing, 4-position throw-over wheel and other deluxe appointments add to your comfort and pleasure in this remarkable new Beechcraft Debonair!

Beechcraft

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

Interested in a Beechcraft Dealership?

Beechcraft sales are zooming. 1959 was the biggest sales year in Beechcraft history (see chart at right). As a franchised Beechcraft Dealer, you can share in this growth. Choice territories now open. Start building your future with America's most-wanted, most complete line of business airplanes. Why not get more facts now? For full information on Beechcraft dealer opportunities, write Beech Aircraft Corporation, Wichita 1, Kansas, U. S. A. or . . .



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COLORADO
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DELAWARE
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Elliott Flying Service

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Topeka Aircraft Sales & Service, Inc.
Topeka
Topeka Aircraft Sales & Service, Inc.
Wichita
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Owensboro
Owensboro Aviation Company

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Francis Aviation
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In shrinking-up this grapefruit of a globe of ours, let's give credit where credit is due; to a legion of dreamers, designers, researchers, and builders who whittled 'er down to size.

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Let's take a look each month, say, at Southwest Airmotive, First With Jets in service and supply. I, Jet Age Joe, Esq., will be pleased to be your host.

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Safety Starts With Instructor

IT would appear from reading the daily press that 1959 might well be the worst year in the history of general aviation from the standpoint of fatal accidents. Whether the final tabulations confirm this fact matters little because the record is bad any way you look at it. There is absolutely no validity in shrugging the situation off with the excuse that there's more flying than ever, hence more accidents.

The point now has been reached where we either do something of substance to reduce the accident rate or the accident rate will automatically reduce general aviation activity and curtail normal growth of this phase of the industry.

In any basic, realistic approach to the problem, one must admit that every pilot first has to learn to fly from an instructor and it follows that if we are ever to get to the roots of the problem we must start with the kind of flight instruction our pilots are receiving from rated instructors.

We recently checked this theory out with a veteran flight instructor who has probably been at the profession longer than any man alive. We respect him for many reasons but his record speaks for itself — he has never had one student involved in an accident while under his tutelage since 1915! He agrees that there are many deficiencies in our present instruction methods and techniques which contribute materially to the alarming accident rate.

This veteran airman says there are "lots of instructors but damn few teachers." Too many instructors take up the profession as a stepping-stone to something "better" and are slipshod in their methods because they don't intend to make a life's work out of instruction.

Many psychological angles are involved. He particularly emphasized that many successful businessmen are now learning to fly; they usually are older than the instructor and the customer is handled with gloves instead of the old-fashioned "German" discipline once used to beat safe flying practices into the student. If a successful businessman who can write a check for $40,000 for an airplane is squeamish in stalls or engine-out exercises, then these maneuvers are often passed over. Weather recognition is neglected because it is sometimes boring and because the student is in too big a hurry to get his ticket and start flying on his own. Any short cut to the certificate seems acceptable.

Our friend also believes that courses at many flight schools are not carried on as approved school courses. Many chief pilots at such schools have too many duties for adequate direction of the instructors under their guidance. We have forgotten that the flight instructor is the only life insurance a student has for a considerable period of time in the student's flight career because it lasts until good judgment from experience becomes the insurance policy.

To pursue the subject farther our mentor suggested that instructors should not be paid on an hourly basis. They should have a good salary and no instructor should be required to fly more than four students or more than four hours in any one day.

Where does the FAA come in? They, too, must accept some of the blame for deficiencies in flight instruction. One suggestion is to create a limited flight instructor rating for new instructors. After he gets five successful private certificate candidates through an FAA agent (not a flight examiner) and meets certain other standards, only then can he receive a commercial flight instructor's rating. Ratings should be null and void after six months of inactivity and all instructors should be subjected to periodic checks.

An attempt should be made to find possible patterns of accident-prone products from certain instructors during accident investigations. Finally, our instructor friend believes that a select group of "old pro" instructors should be called in by the FAA and sit down with competent FAA safety people in an attempt to come up with a modernized curricula to meet present requirements of new aircraft, changing flight conditions, new techniques in instruction methods, a sounder approach to ground school instruction with emphasis on meteorology and instruments and all related matters. Meanwhile a lot of sloppy instruction could be nipped in the bud by closer supervision by the FAA. There's a tragic lack of intelligent standardization.

It is not for us to say that the flight instructors must take the major blame for the awful statistics in general aviation. But it sounds mighty reasonable that we have to start with primary and basic flight instruction if the present trend is to be arrested.

Investors 'Discover' Lightplane Industry

COMMON stocks of the "Big Three" lightplane manufacturers are at a new all-time high. During the past year Beech Aircraft went from a low of 28 to a high of 65, Cessna from 43 to 104, Piper from 20 to 53. Quotations on the New York Stock Exchange during the latter part of December reveal all three wound up the year close to the all-time highs. Few common stocks can match the performance of these three in 1959.

The figures are significant from several standpoints. The stock market is the best barometer available as to business conditions, not only from a general standpoint but also from an individual industry or company standpoint. The market simply reflects the U. S. lightplane industry is enjoying its most profitable period in history.

Another significant observation is that American investors have "discovered" the lightplane industry as a good place in which to invest funds.

The industry offers healthy dividends plus growth — the most desirable combination for any investor.

Not only does the performance of these common stocks reflect the economic health and bright outlook for the future of the lightplane industry — the meteoric rise definitely brings to an end the age-old curse upon the industry which made it, in investors' eyes, too speculative.

But there is one deeply significant fact not generally recognized from these optimistic figures at first blush. It has to do with the general economic health of most every concern vitally involved with the lightplane industry — the major suppliers and the sales and service organizations, whose progress and growth are also reflected by the principal security prices. In fact, were it not for these two mainsprings of the lightplane industry and their contribution to the over-all development and marketing efforts of the industry, it's apparent the airframe manufacturers would not be where they are today.

None of us stands alone in this business. We are all inter-related and totally dependent on all the other segments involved. This fact makes the historical performance of the lightplane industry during the past few years a remarkable saga in U. S. business and a major "break-through" many hardy pioneers, dreamers and dedicated leaders worked lifetimes to achieve.

★ ★ ★

Airmen's Calendar

Jan. 18-20—12th Annual Helicopter Association of America Meeting, Disneyland Hotel, Anaheim, Calif.

Jan. 18-Feb. 5—Aviation Institute for Business Pilots and Commercial Carriers, University of Southern California, Los Angeles.

Jan. 20-21—Airport Operators Council Board Meeting, Statler Hotel, Washington, D. C.

Jan. 25-26—Annual Meeting, Association of Local Transport Airlines, National Aviation Club, Washington, D. C.

Jan. 25-28—28th Annual Institute of Aeronautical Sciences Meeting, Hotel Astor, New York City.

Jan. 27—Mooney Aircraft Annual Sales Meeting, Kerrville, Texas.

Feb. 5-7—Texas Flying Farmers Convention, Texas Hotel, Ft. Worth.

Feb. 16-18—1st National Symposium on Non-Destructive Testing of Aircraft and Missile Components, Hilton Hotel, San Antonio, William E. Cory, general chairman, Southwest Research Institute, Box 2296, San Antonio.

Feb. 27—Antique Airplane Association's First Annual Dinner-Dance, Hotel Edison, New York City.

March 24-26—4th National Conference on Aviation Education, Brown Palace Hotel, Denver. Address Inquiries to Dr. William Hinkley, Supt. of Schools, Aurora, Colo.

May 11-14—16th Annual National Forum, American Helicopter Society, Sheraton Park Hotel, Washington, D. C., with Trade Exhibit and Air Show. Address Inquiries to Harry M. Lounsbury, Exec. Scty., 2 East 64th St., New York 21, N. Y.

May 22-26 — Airport Operators Council Annual Membership Meeting, Deschler Hotel, Columbus, Ohio.

NATIONAL PILOTS ASSOCIATION CITATIONS were presented to the three pilots below during the Wright Brothers Annual Dinner in New York last month. Miss Jerrie Cobb of Aero Design & Engineering Co. was cited for speed, altitude and distance records in Aero Commanders and Captain Walter Moran and First Officer James Carner of American Airlines were cited for diverting their scheduled DC-6 to find a student pilot lost above the overcast and leading him to a safe landing. A fourth citation, for presentation later, was made to Dr. August Raspet, head of the Aerophysics Department, Mississippi State University, for accomplishments in aircraft drag reduction and lift augmentation.

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On forbidden ice packs off Siberia, long trail ends for Tom Bolack and largest bear ever recorded. Hunting many days with chartered light aircraft, Bolack finally tracked bear 100 miles in 50-below cold, landed, shot him as he charged at 50 yards.

World-record polar bear is 30th bear Bolack has killed. Burns Maus (L), Champion Spark Plug Co. Aviation Sales Mgr., questions Bolack about hazardous Siberian flight.

One of several P-51 Allison aircraft engines (mobile unit) simultaneously pumping sand/oil into well to jar oil loose. Engines run full-throttle—if plug misfires, well could be lost!

Bolack dropped this 6-ton bull at 75 yds. By plane, jeep and truck—Champion-equipped and with Bolack himself looking after engines—Bolack traversed 3,500 miles, hunting Sahara to Congo, bagging hippo, lion, oryx, giraffe, cape buffalo, eland and addax.

(Advertisement)

A behind-scenes report on aviation booster Tom Bolack and his most unusual interest in aircraft engines

No Margin For Error

by HERB FISHER, *international aviation authority, veteran test pilot, author*

Sportsmen the world over were awed recently when big game hunter Tom Bolack slipped into the forbidden ice wastes off Siberia in a chartered light plane and tracked down the largest bear known to man.

Appraising the 13-foot monster at Bolack's Farmington, New Mexico, ranch, I asked: "Tom . . . how do you do it?"

"Simple, Herb," he laughed. "First you have to strike oil—then you just go out and do these things . . ."

Indeed, a dozen years ago the only "wealth" Bolack had was the geology knowledge in his head. He was practically penniless. Today he's a multi-millionaire businessman and statesman—a respected force in oil, gas, uranium, federal land reclamation, experimental

Herb Fisher

agriculture, politics, government, philanthropy, big game hunting, aviation promotion. Bolack's rags-to-riches rise wasn't as "simple" as he makes it sound, however. Those who know him best will tell you it came about from early years of sweat and blood—hardship—followed by shrewd business investments and dedicated leadership in projects benefiting the Southwest.

It was Bolack's interest in general aviation—and a fascinating story I heard about a *most* unusual interest in aircraft engines—that took me to see him. In business, he uses airplanes like most people use telephones, having become an airline "million-miler" in very few years.

On hunting expeditions — Africa to the Arctic — he charters light aircraft and surprises pilots with his know-how on flight conditions and engine performance. As an aviation booster, he was instrumental in getting better airport facilities and service at Farmington. But it's in the oil fields that he utilizes Allison aircraft engines in a way that'd make a P-51 think it's an X-15 . . .

"Tom, what about those aircraft engines in the oil fields—and the tie-in to that highly dangerous hunter-plane mission off Siberia? I don't know what oil fields have to do with aircraft engines, but I do know that your 'bush pilot' guides, Leon Shellabarger and Johnny Swiss, tell me you got that world-record bear under the most adverse flight conditions imaginable . . . And they tell me something else—the main reason I'm here—that you've got a 'bug' for poking into a plane's engine to see what's in it before flying off into the wilds . . ."

"Herb," said Bolack, "when you work up in the oil fields, you get to know engines inside and out—all kinds, especially aircraft—and you get mighty critical of them. You see, to knock oil loose from good geological formations that just aren't 'giving,' we take a bunch of mobile Allison aircraft engines and pump sand and oil into the nonproductive wells—maybe 50 tons of sand—at 100 barrels a minute! We run these Allisons for a couple of hours at *full throttle*, maximum torque—like running a plane at take-off for two hours.

"That's where you learn to 'tell the men from the boys' in the way of equipment. Here's a classic example: Because this well-fracing process requires continuous, uniform, maximum pumping pressure, *one little ol' misfiring spark plug could cause us to lose a million-dollar oil well!* That's why those Allison aircraft engines have Champions in them—it's attention to 'details' like that which often makes the *big* difference. And that's why, Herb, when I charter a plane for 75-below Arctic hunting or 130-above jungle or desert flying, I often check to see if *it's* got Champions. In the oil fields, a plug could be worth a million dollars. In the air, it could be priceless."

I was frankly amazed—as well as intrigued—by Bolack's statement that a single plug could cost him a million-dollar well, and we went out to look over a nearby well-fracing project. Later, back in his museum-like trophy room, laden with scores of animals from many hunts in many parts of the world, I told Bolack I knew darn well he hadn't gone "spark plug inspecting" on the many days he and Shellabarger looked for that world-record bear—"because Shellabarger's an old pro at this Arctic 'bush flying,' and he told me he'd made it clear to you long ago that he flies on nothing *but* Champions under those operating conditions."

"That's right, Herb," Bolack said. "And let me tell you about those operating conditions: I'd been after that big bear for quite some time. I'd become convinced that the real giants ranged far out to sea on the ice, and that I'd have to go 'way out where you just don't go. Shellabarger, Swiss and I decided anyway to hunt as far out as our two light planes could range—carrying extra gas—despite the possibility of blizzards or 'white-outs' cutting off our return 200 miles offshore. Let me tell you, the Arctic is death itself. Gale winds drive fine snow into your engines, and moisture as well as extreme cold is an ignition problem. Ask Shellabarger—in '55, engine trouble forced him down 100 miles offshore, and he spent 36 hours on floating ice during a blizzard. You've *got* to have dependable equipment and plugs. Anyway, some mornings we'd take off when you couldn't see a windsock at 50 feet. We'd apply fire pots to unfreeze the engines—it was 50 below. And, I might add, we had instant 'cold-starting'—how do you like that for plug dependability?"

The flying hunters defied Soviets as well as blizzards the day Bolack finally sighted the monstrous bear tracks. Not worried about their engines but plenty worried about their dwindling gas supply, they tracked the great bear for 100 miles, over the Bering Sea to the Siberian coast. There they chanced a landing on treacherous ice—with just barely enough gas in their five-gallon auxiliary cans to get them back to Alaska—and Bolack shot the brute as he charged the frantic men at 50 yards.

"Not one misfire—*fortunately*—gun *or* plugs!" Bolack said. "But, Herb, I think this will be my last Arctic hunt, for two reasons: Arctic air hunting is the most dangerous sport in the world—and I'll never find a bigger bear!"

SUCCESS FORMULA FOR BAGGING A WORLD-RECORD BEAR

Tom Bolack, poor Kansas farm boy. Oil field "roughneck" at 16, driller at 19, supt. at 21; two years, Kan. Oil Commission. Lived, breathed geology – self-taught. Wandered New Mexico broke, hungry; ridiculed for oil search. In 1946, age 27, borrowed $600, acquired "choice wasteland," 25¢ acre. Months of toil . . . finally, three of the best wells ever drilled in that now highly productive area – one with 8,000-barrel-a-day indicated capacity! Tom counted first of several millions in 1950; nationally honored as "Oil Man of the Year."

In 10 years, shrewd investments and civic work catapulted him to one of state's wealthiest, most prominent leaders: Elected to State Legislature. Mayor of Farmington ('52-'54). Organized Aqualante bloc, set up offices in Washington, D.C., at own expense, for two years led four-state citizens movement that pushed through Congress West's greatest land reclamation project – Upper Colorado River Water Bill. Cited by President, Congressmen, Navajo Nation. State's "Outstanding Citizen Award," '58. Appointed by Pres. Eisenhower to U.S. Assay Commission. Advisor, U.S. Small Business Administration.

President 3 years and now chairman of Executive Committee of Petro-Atlas Corp., Floyd Odlum's Atlas Corp. subsidiary, and director of Atlas' uranium company. Also, a national director of Boy Scouts of America, Independent Petroleum Assn. of America, Uranium Ore Producers Assn., Uranium Institute of America, N. M. Oil & Gas Assn., Independent Petroleum Producers Royalty Owners Assn., N. M. Land Resources Commission. Headed hospital, airport building campaigns. Established state's only privately operated experimental farm – greenhouses, vast irrigated lands, "super-vegetables."

Because of necessity for dependable oil-field machinery, Bolack's many trucks, tractors, jeeps, roto-tillers on his nationally acclaimed experimental farm are also Champion-equipped.

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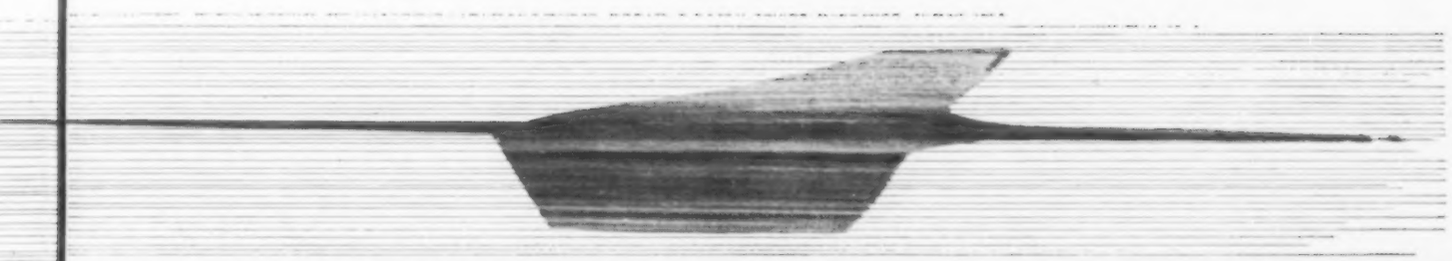

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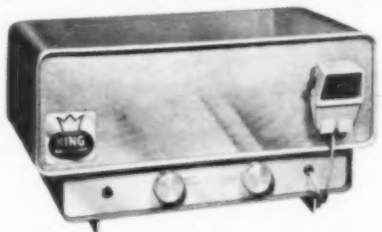

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The pup's world stops just a short step outside the elegant cabin. Aboard the Aero Commander, surrounded by creature comforts, her master knows why he chose this luxurious business twin:

Pilot or passenger, you relax in an individual, reclining chair with deep, foam cushions, tuckaway arm rests and a contour back. Each chair glides fore or aft, as you wish, and each is by its own window.

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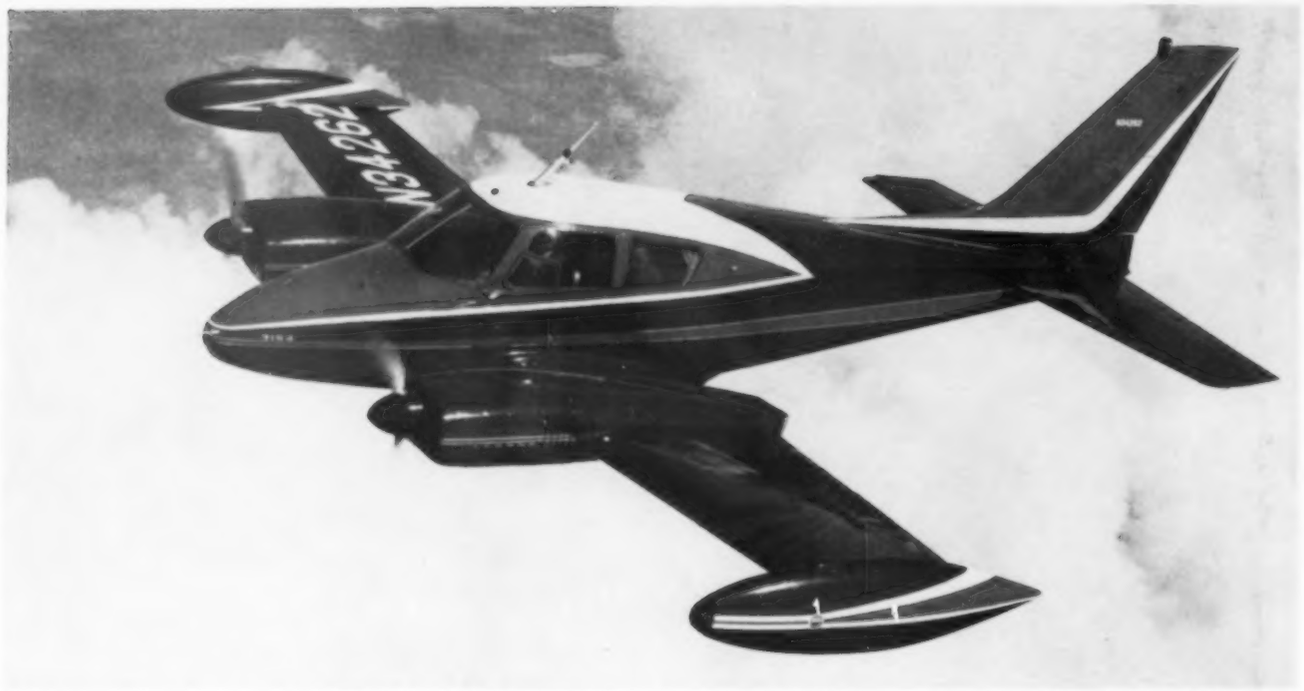


New swept tail and new paint design give 1960 Cessna 310D new appearance. Performance remains unchanged, two 260-hp. fuel-injected Continentals giving 220-mph. cruise on 70% power at 8,000 ft. Price of $59,950 remains unchanged from 1959.

—(Cessna Photo.)

Cessna's New 310D Twin

A NEW swept tail features the new 1960 5-place, twin-engine Cessna Model 310D. It is priced at $59,950, unchanged from the 1959 Model 310C, and has the same performance including 242-mph. top speed and 220-mph. cruising speed, the latter being on 70% hp. at 8,000 ft.

Factory figures show the 310D has an empty weight of 3,037 lbs., which is 17 lbs. higher than that of the 310C. Gross weight remains the same at 4,830 lbs., for a useful load of 1,793 lbs. for the D Model.

A major change for 1960 is the 310D's new non-congealing oil cooler as an integral part of the oil system. It provides a constant flow of engine oil through a warm-up passage in the center portion of the cooler. When the oil temperature reaches upper operating limits, a preset Vernatherm valve closes to divert oil flow and circulate it through fin-cooled veins located on either side of the center warm-up.

(Continued on page 74)

Various Cessna 310D seating arrangements include handy couch.

1960 Cessna 310D

Factory Data

Price	$59,950
Power (2 Cont'l. IO-470-D's), hp.	520
Gr. Wt., lbs.	4,830
Empty Wt., lbs.	3,037
Useful Ld., lbs.	1,793
Useful Pct. of Gr. Wt.	37.1
Std. Fuel Cap., gals.	102
Opt. Fuel Cap., gals.	133
Oil Cap., gals.	6
Bag. Cap., lbs.	200
Top Spd., mph.	242
Cr. Spd., 70% hp., 8,000 ft., mph.	220

All-out Range—

Mi.	Hrs.	Mph.	Alt., ft.	Gals.
825	3.8	218	8,000	100
1,070	4.9	218	8,000	130
1,440	8.4	171	10,000	130

Stall Spd., mph.	69
Min. SE Control Speed, mph.	82
Rate of Climb, fpm.	1,800
SE Rate of Climb, fpm.	440
Svc. Clng., ft.	21,300
SE Svc. Clng., ft.	7,700
Take-off Distance—	
Ground Run, ft.	800
Total over 50-ft. Obst., ft.	1,395
Landing Distance, (4,600 lbs.)—	
Landing Roll, ft.	620
Total over 50-ft. Obst., ft.	1,720
Span, ft.	36
Length, ft.	29.5
Height, ft.	9.93
Wing Area, sq. ft.	175
Wing Loading, lbs. sq. ft.	27.6
Pow. Loading, lbs. hp.	9.3

NOTES: Performance is for gross weight at sea level unless noted.

Olive Ann Beech was there.

DESERT AIR SHOW

NORMAN Larson, enterprising Southern California Beechcraft distributor, staged his showing of 1960 Beech models at John Noyes' colorful Palm Desert Airpark near Palm Springs. Larson's dealers and customers and Palm Springs resorters enjoyed a first-hand inspection of the new Beechcrafts with factory leaders from Wichita on hand to lend a hand, including Olive Ann Beech, president. Jim Yarnell, the noted Beech cameraman, got these outstanding photos during the show. Airpark adjoins Desert Air Hotel and Resort.

CESSNA'S new 4-place Model 210, first high-wing single-engine business plane with retractable landing gear, is being delivered in growing numbers to dealers and customers throughout the country and demonstration flights are proving it to be an outstanding performer. Its short-field performance is no less than phenomenal, and it has better than 1,500-fpm. rate of climb at sea level, 1,000-fpm. climb at 5,000 ft., and 720-fpm. climb at 10,000 ft. Cross-country performance is up at the top of the Cessna ladder — the 210 is 20 mph. faster than the Model 182.

We enjoyed a trip last month in the No. 2 Model 210 off the production line. With Tony Lansbarkis and Bill Robinson of the factory, we flew 2,786 miles from Wichita to Dallas — via Long Beach, California. In this demonstration flight, the new 210 performed convincingly in the 180-mph. cruise bracket.

This brings real transportation to the single-engine Cessna line. The build-up in speed is accomplished with more power — the 210 has a 260-hp. fuel-injected Continental engine — and gear retraction for aerodynamic cleanup. The airplane itself remains

At sunny Palm Springs, we used the airport's loading gate and huge palms in pictures showing the Cessna 210's swept-tail and long-fuselage lines.

—(FLIGHT MAGAZINE Photos.)

Retractable landing gear helps make the 210 Cessna 20 mph. faster than the Cessna 182.

Quick Tripper

By TOM ASHLEY

100% Cessna high-wing and so do its handling characteristics. The 210 is typical Cessna up-grading while adhering to the same basic configuration of the entire line of Cessna single-engine airplanes. This enables Cessna customers to advance all the way from learning to fly in a 2-place Model 150 or Model 172 through the 175 and 182 into the high-performance Model 210 without drastic transition in between models. It also enables Cessna to control a very large segment of the single-engine market, which is the major reason why the company did not switch to a low-wing or otherwise drastic design change for its top-o-the-line Model 210.

At a gross weight of 2,900 lbs., the 210 has a useful load of 1,140 lbs. and a fuel capacity of 65 gals. Our demonstrator was equipped with 108 lbs. of optional equipment, including two Narco Mark V's, Lear ADF, oxygen system, gyros and rotating beacon. With full tanks, our airplane's allowable weight for people and baggage was just under 650 lbs.

The fuel-injected 260-hp. Continental IO-470-E engine in the 210 is rated at 2,625 rpm., with the factory manual suggesting 2,450 rpm. for performance cruise and 2,200 rpm. for economy cruise. Lansbarkis used 2,300 rpm. for cruise throughout our trip, manifold pressure selection ranging from 22.5 ins. at 3,000 ft. to 18.5 ins. at 11,700 ft. Computations showed these settings to equal a power range from 63% down to 55% of rated power.

Cessna 210 Trip Log

Dec. 10-13, 1959

Leg	MP-Rpm.	Alt.	% Hp.	IAS Mph.	TAS Mph.	GS Mph.	Mi.	Hrs.
Wichita to Amarillo	22-2,300	5,000	62	165	180	156	314	2:01
Amarillo to El Paso	20-2,300	10,500	57	157	185	152	397	2:33
El Paso to Phoenix	21-2,300	8,500	60	162	187	176	380	2:11
Phoenix to Palm Springs	22-2,300	6,500	62	164	185	191	270	1:27
Palm Springs to Long Beach	22-2,300	8,500	61	165	192	174	110	0:37
Long Beach to El Paso	18.5-2,300	11,700	55	155	189	215	725	3:23
El Paso to Dallas	18.5-2,300	11,700	55	155	189	221	590	2:40
Totals or Average						187	2,786	14:52

It was plain to see that the 210 had real performance as soon as we started Southwest out of Wichita. Staying low because of headwinds, we leveled off at only 3,000 ft., using 22.5 ins. and 2,300 rpm. for an indicated air speed of 165 mph. and a true air speed of 174 mph. Before reaching Amarillo, we had worked up to 5,000 ft., truing 180. We were cruising along the windiest alley in America, however, and our wind factor turned out to be minus 22 to 24 mph. because our ground-to-ground speed for the 314 miles from the factory to Amarillo was 156 mph., off-to-on time being 2 hrs. 1 min.

We went to 10,500 ft. for the Amarillo-El Paso leg, using 20 ins. with 2,300 rpm. to indicate 157 mph. for a true air speed of 185 mph. Rather than cut across the mountains through wilderness areas, we chose to go around through Carlsbad and Guadalupe Pass and this stretched our mileage to 397 to El Paso, the 210 covering it in 2 hrs. 33 mins. for a ground-to-ground speed of 152 mph. with a wind factor of minus 33 mph.

The winds treated us more kindly from El Paso to California. On the El Paso-Phoenix leg, which we flew via Tucson on the Southern route, we used a power setting of 21 ins. and 2,300 rpm. at 8,500 ft., where the 210

With Tony Lansbarkis of Cessna as our baggage-handling model, this nose portrait emphasizes the 210's wide main gear and bulge under propeller spinner for forward-retracting nose gear.
—(FLIGHT MAGAZINE Photo.)

Three interesting air views here were among many photographed from the high-wing 210. At left is Palm Springs beneath the gathering haze of dusk as we climbed out for Banning Pass and Long Beach. Center above shows rugged Tucson mountains beneath broken clouds. Photo at right shows line of lenticular clouds at 20,000 ft. and their shadows — vivid "mountain wave" symbols of high and turbulent winds off the mountains at Guadalupe near El Paso. Note drooped wingtip of 210.

—(FLIGHT MAGAZINE Photos.)

gave us 162 mph. IAS and 187 mph. TAS, covering the 380 miles in 2:11 for an average of 176 mph., and we went on into Palm Springs at 6,500 ft., using 22 ins. and 2,300 rpm. in 1 hr. 27 mins. for 191 miles, averaging 191 mph. on the ground with some help.

At Long Beach, we totalled up the figures while enjoying the beautiful new sales and service base opened there recently by Larry Hunt's Air Oasis firm — we had covered 1,461 miles in 8 hrs. 50 mins. for an average ground speed of about 162 mph. This is good transportation for a single-engine airplane flying West into winds as high as ours had been. We had been comfortable, too, with no fatigue.

If the 210 could do so well going West, surely it would step high, wide and handsome on our way back with any break at all from the wind. Although we have never yet enjoyed a tailwind all the way home from California, the prospects appeared more than good for the next day, which was Sunday. We had to make it all the way, too, because we had a summons for jury duty at the court house back home for 9 a. m. Monday and there was no way out of serving because we had postponed it from a month earlier. If anybody ever needed favorable VFR weather for a fast single-engine trip halfway across the country in daylight during the short hours of mid-December, we did. Losing two hours in time zones complicated the outlook.

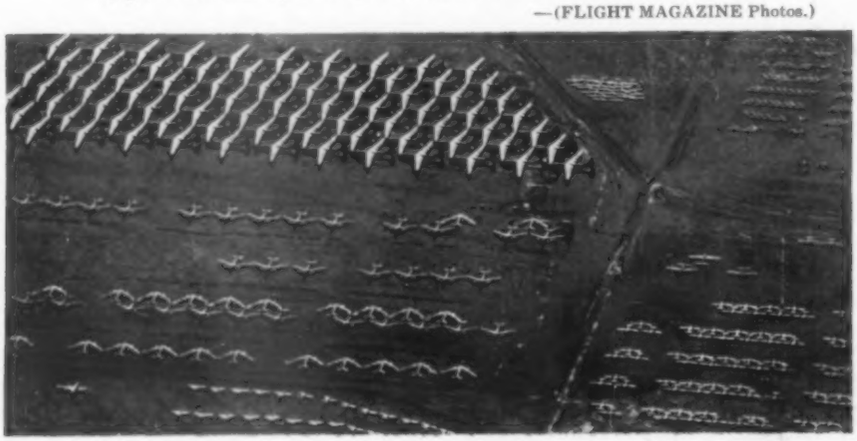
That night in the motel near the airport, the TV weatherman showed us a storm front bearing down on Southern California and it promised all the help we needed — if early-morning local conditions would permit a VFR departure soon enough. We could tell from looking outside before breakfast that the storm was moving fast. While climbing out of Long Beach we could see that Banning Pass was already catching it. We flight-planned our course to swing around South toward San Diego, crossing the hump just in front of the weather before it reached that area. It took us on top but the early clouds remained broken and we were able to stay in the clear at 11,700 ft. when we turned East, coming out of the coastal range in the El Centro area with a booming 35-mph. tail wind.

Using 18.5 ins. of manifold pressure and 2,300 rpm., the 210 indicated 155 mph. at 11,700 ft. and at 38 degrees outside air temperature our true air speed was way up there at 189 mph. When Yuma came up, a ground speed check showed we had been scooting at a good 223 mph., and this picked up to 248 mph. as the winds began scooping up a sandstorm on the desert floor far below.

On past Tucson, we tried 13,500 ft. for a while, in hopes of picking up some more help. The 210 had a handy oxygen system, with 1,500 lbs. showing on the dial, and we used the masks for about an hour until a ground speed check showed we had lost our advantage. So we let down to resume our 11,700-ft. cruise, holding it all the

Over surplus military aircraft depot at Tucson, our long-lens camera caught close-up of giant armadas of B-36's, B-47's and smaller craft in dead storage.

—(FLIGHT MAGAZINE Photos.)



Pride of Jim Gavin's Mercury Helicopter Service at Palm Springs is this brand-new 4-place Bell 47J Ranger in which Gavin showed us the sights around the resort. With him is Dick Peck (dark shirt) of the Hiller factory, in town demonstrating his new 3-place 12E.

—(FLIGHT MAGAZINE Photo.)

At Long Beach, we parked the 210 on the new 12-acre Air Oasis ramp. Air Oasis is Cessna's largest distributor with staff of 85 and 15 dealers.

A Visit to Air Oasis — Top Cessna Distributor

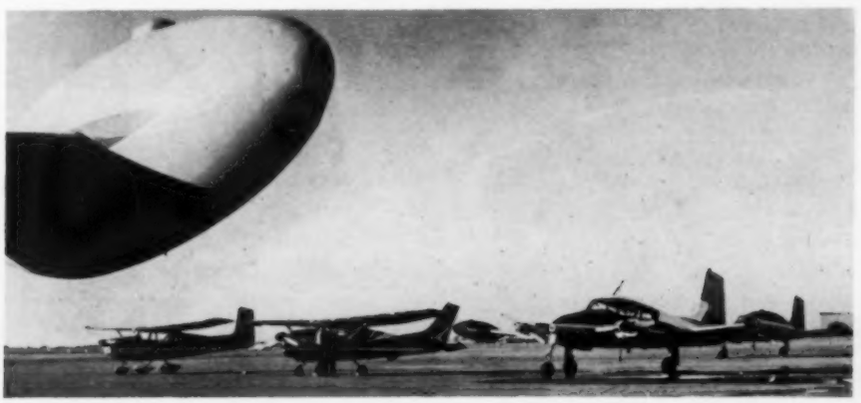
TOP distributor in Cessna's worldwide aircraft sales network is Air Oasis of Long Beach, California. Headed by Larry Hunt, this fast-growing firm has a staff of 85, 5 salesmen and 15 dealers and this year moved into a new $600,000 facility which could well serve as a model of efficiency for aircraft sales and service operators elsewhere.

Our visit showed us that pictures and even a bird's eye view fail to do justice to the thorough planning, generous size and completeness of the Air Oasis plant. It's the first we've seen, for example, with plenty of room for all departments (except T-hangars, more being planned). It efficiently separates all departments and isolates aircraft sales completely from maintenance and parts, boasting a large new-plane showroom. Plans provide for expansion.

Air Oasis grossed $3 million in 1957, $3.8 million in 1958 and $4.6 million in 1959 and follows a month-to-month statistical growth projection which calculates a $9 million gross for 1965. Cessna 310 twins are proving more popular than ever in California, Air Oasis selling 15 in 1956, 18 in 1957, 23 in 1958 and 27 in 1959. The firm has already ordered 25 for 1960. It sold 250 new aircraft during 1959 and has a quota of 278 for 1960.

With its own finance company handling sales to customers and dealers, very large stock and parts inventories and extensive aircraft, engine, radio and other shops, Air Oasis looks more like the West Coast branch of the Cessna factory than anything else.

Larry Hunt (left, below, with Cessna President Dwane Wallace) built Air Oasis sales from $208,000 to $4.6 million in 8 years.



way into El Paso. Our route was 725 miles from Long Beach, where we had taken off at 8:08 a. m., and we were on at El Paso at 11:31. This gave us an average ground speed of 215 mph. with a wind factor of plus 26 mph., the unrewarding hour at 13,500 ft. having chopped off some of the help. We knew better than to fool around experimenting but things were going so good we couldn't resist the temptation to try for more.

Back at 11,700 ft. again after taking off from El Paso at 12:35 noon, we decided to hold what we had with 155 indicated on 18.5 ins. and 2,300 rpm. and an outside temperature of 40 degrees. We figured the odds were against the tailwind holding all the way, because we normally get a southerly flow east of El Paso on the trips we have made, and that would cancel out any advantages already accrued. But when Midland came up we were still averaging 225 on the ground. We landed at Dallas at 3:15 p. m., with local time running 2 hours later and the sun setting as we landed.

The 210, with some very good help, had brought us 1,315 miles from Long Beach during daylight hours and VFR all the way despite a loss of 2 hours crossing time zones and another hour for lunch on the El Paso stop. Flight time was 6 hrs. and 3 mins. for an average of better than 215 mph. with a 26-mph. average tailwind.

Our complete trip in the 210 totalled 2,786 miles from Wichita to Long Beach to Dallas and our travel time had averaged out to be 187 mph. This is the most VFR transportation we have ever obtained from a single-engine airplane on any extended cross-country trip and reflects the measure of air travel capabilities offered by the new Cessna 210. Our fuel consumption averaged out 13.1 gals. per hour.

FAA Facilities Implementation

By JOSEPH H. TIPPETS
Director (acting) Bureau of Facilities, Federal Aviation Agency

HERE'S a recent report by the Author to the National Pilots Association on the status of the FAA facilities implementation program. In it are such facts as the following: 15 new buildings have been completed or are under construction and more are planned for ATC centers. . . . air traffic control automation is going ahead with 3 automatic computers in use and 3 more being installed. . . . Of 84 long-range radars planned, 32 are operating. . . . 597 VOR's are operating, of which 256 have Tacan for Vortac combination. . . . Control towers operating number 217 with 49 more funded. . . . 173 ILS systems are operating with 57 more funded. . . . 48 airport surveillance radars have been installed with 34 more scheduled for 1960. . . . New runway visual range for determining actual landing minimums by electronic measurement is in use at 5 major airports and will be in use at 24 major airports by July 1.

OUR aviation facilities system is growing so rapidly in size and complexity that it is becoming increasingly difficult to give a fair picture of it in a short discussion.

There is no need for me to explain the explosion-like growth of aviation in the last fifteen years and the tremendous strain which it has placed on our aviation facilities system, including airports. Up until a few years ago we were rapidly falling behind in our abilitiy to meet effectively the aviation requirements. However, our position is now greatly improved. To a large extent this results from the recognition in Congress of the importance of aviation to the national economy and to the fine work of the Curtis Committee, which was instrumental in setting up the Federal Aviation Agency. The increased appreciation of our problem by Congress has been demonstrated by the large increase in annual appropriations for Federally-financed facilities which started in Fiscal Year 1957. We went from annual appropriations for new work of about $5-10 million annually in the period through 1955 to an average of well over $100 million in recent years. As a result of these increased funds, we were able to provide not only for the standard aviation facilities, such as air traffic control facilities, control towers, instrument landing systems, and approach lighting systems, but also for the extensive VHF navigational system which is replacing the obsolescent low frequency system which was so limited in reliability and usefulness. We have also been able to provide radar coverage over our major air terminal areas and principal airways, thereby providing a valuable tool to the air traffic controller.

The Curtis Committee provided an invaluable service to aviation by recommending central authority to provide for its guidance and by encouraging a strong research and development effort to solve some of the perplexing problems which have been facing both civil and military aviation since World War II. The research and development effort was established first in the body of the Airways Modernization Board and made it possible to provide central direction to the many projects which were under way in this area by various interested agencies. The other cardinal accomplishment of the Curtis Report was the establishment of the Federal Aviation Agency to provide for the development, establishment and operation of a single facilities system for aviation. This was accomplished by the merger of CAA, the Airways Modernization Board and certain functions of CAB. In addition, of course, the Administrator has been charged with the responsibility for the control of the Nation's airspace, thereby providing a most important resource in the exercise of efficient air traffic control.

In looking at the status of our facilities system, it is convenient to consider it in four parts or subsystems.

The first is the Air Traffic Control System which provides the means for control of all aircraft which elect to take advantage of this valuable service for operation during poor visibility or for safety in high altitude jet flights.

Next, is the Air Navigation System which provides to all aviation users an assured method of navigation as well as a means of determining their location. It also provides a basic route structure over which the air traffic control can be exercised.

The third system includes the major terminal areas in which air traffic originates and terminates. This varies a little from the preceding two systems which are integral on a nationwide basis since each terminal area is a problem in itself — in some cases, such as New York, of staggering proportions.

The last system includes the communication and weather facilities, which provide over-all service in support of all three of the preceding systems, as well as aiding aviation interests in general.

Air Traffic Control System

The Air Traffic Control System is the one in which requirements are expanding most rapidly and, therefore, is receiving the major part of our attention. We have important projects under way now to provide for intergration of our system with the Air Defense System, both under peacetime and wartime conditions. The need for this close coordination must be obvious to all since we must be ready for rapid transition from peace to war, if the need ever arises. A good deal of our effort has also been directed toward improving our air traffic control center buildings in order that adequate space may be provided for the modern radar equipments which are providing enroute flight information, and to permit necessary expansion of air traffic control services. In addition, we are planning ahead for the automation of these centers in order to reduce the staggering manpower requirement at some of these centers as the air traffic volume continues to mount. We now have 15 modern center buildings finished or under construction and more in prospect for the future.

In our research of a means for auto-

mating the air traffic control system we are already using, on a test basis, automatic computers at three of our centers for the purpose of preparing and updating flight strips. Three additional are now being installed. The Bureau of Research and Development is also developing the Data Processing Central equipment which will permit the automation of our air traffic control centers. This equipment will be tested in the next two years, and it is hoped that we can start installation of operational equipment in 1962.

We have a total of 84 long-range radars planned for incorporation in our system. Thirty-two are already operating and providing us valuable information for use in air traffic control. We are making full use of military radars to meet this requirement where their location and method of operation is useful for our purposes. In such cases, it is only necessary for us to transmit the radar information to our centers for utilization. We have other supporting programs now under way, such as radar beacons and three dimension radars which will provide more refined data and permit even better air traffic control than is permitted by our present facilities.

Air Navigation System

In the air navigation system we are still progressing rapidly; we already have 597 VOR's operating, and by January 1, should have 256 TACAN's working with VOR in the combination which we call VORTAC. These VORTAC facilities will provide both azimuth and distance information to civil as well as military aircraft. We still have 289 L/MF four-course ranges which we are decommissioning as soon as local conditions permit, since it is difficult to operate two navigational systems at the same time. Eighty-seven of these low frequency facilities will be retained for use as continuous weather broadcast facilities at increased power. In addition, of course, we still have many non-directional beacons and we are beginning to establish some long distance navigational aids for use in overseas operations.

Terminal Area System

In our terminal area system the airport is, of course, the facility of primary importance. Here, too, we have made outstanding progress in recent years, particularly under the stimulus of the introduction of the new jet aircraft. We are rapidly providing, under the provisions of the Federal-aid Airport Program, improved facilities at those airports which are scheduled for jet service. This program is being helped by the revised Federal Airport Act which was passed in the last session of Congress using the same approach as was employed in the Federal Aviation Act. The Administration and Congress realized that the twelve-year-old Federal Airport Act was likewise out of date and that it, too, needed streamlining and modernizing to meet the radically changed conditions currently facing us in the vital field of aviation activity.

Congress saw fit to extend the Federal Airport Act for two years at its current annual $63 million contractual authorization level. However, the Congress did make some basic changes in the type of work eligible for Federal aid. By law, Federal participation in passenger automobile parking areas and in certain parts of airport buildings was definitely prohibited. Furthermore, the Administrator of the Federal Aviation Agency was given wide discretion when programming Federal funds for any portion of airport buildings not specifically prohibited by the Act.

Specifically, the Act provides that the construction of parts of airport buildings intended for use as bars, cocktail lounges, night clubs, theaters, private clubs, garages, hotel rooms, commercial offices and game rooms shall not be allowable for Federal aid. The Act also makes ineligible the construction of any other part of a building intended for any use, which in the opinion of the Administrator, is not essential for the safety, convenience or comfort of persons using the airport for public aviation purposes.

The Federal Aviation Agency considers its responsibility can best be met by making grants of funds which are intended primarily to increase the safety of airport operations. The Agency has no intention of sacrificing public safety in order to help construct non-safety terminal building projects. The Administrator has specifically stated that no terminal building construction will be approved as an eligible project cost if it means that a safety requirement must remain unsatisfied.

When we speak of a safety requirement, we are thinking principally of facilities needed for the safe operation of aircraft. In this group are items of airport landing area development, such as runways, taxiways, aprons and field lighting. Included also are items such as land acquisition, obstruction removal and building space to house airport air traffic control, communications and weather reporting activities. Such items will be afforded first priority in preparing the national program. Because of the top priority assigned airport landing area construction, it naturally follows that relatively few terminal buildings will be included in the Federal-aid Airport Program. In states like Illinois and Michigan, where airport demands for Federal funds are traditionally heavy, there is little likelihood that Federal funds will be made available for airport terminal building construction other than control towers and other

(Continued on page 58)

Of 40,450 Utility Planes with 2-Way Radio, 27,580 Have Omni, 8,390 Have ADF and 6,100 Have ILS

A FEDERAL Aviation Agency report issued last month shows that about 61% of the nation's 66,000 general aviation aircraft are equipped with radio receiver-transmitters. Aircraft with two-way radio on Jan. 1, 1958, numbered 40,450, of which 35,700 were single-engine and 5,190 were multi-engine. Among the single-engine aircraft, 10,410 were 1 and 2-place types and 24,660 were 3-place or larger. Among the multi-engine aircraft, 3,170 were of 800 total horsepower or less, 1,260 were of 801-2,000 hp., and 760 were of more than 2,000 hp. Helicopters with two-way radio numbered 150.

Of the 40,450 aircraft with two-way radio, 27,580 were equipped with VOR for omnirange navigation. Among these were 19,440 3-place or larger single-engine aircraft, 3,220 1-2-place single-engine aircraft, 3,030 multi-engine aircraft of 800 hp. or less, 1,150 multi-engine aircraft of 901-2,000 hp., and 730 multi-engine aircraft of over 2,000 hp.

Aircraft with ILS, ADF and DME equipment totaled 14,810, the breakdown being 8,390 with ADF only, 5,090 with ADF and ILS, 1,020 with ILS only and 310 with DME added. Of those with ADF only, 6,530 were 3-place or larger single-engine and 1,270 were multi-engine aircraft of 800 hp. or less. Those with ADF and ILS included 1,660 3-place or larger single-engine aircraft and 3,390 multi-engine, the latter being 1,800 of 800 hp. or less, 1,030 of 801-2,000 hp., and 560 of over 2,000 hp. Those with IME were all multi-engine, 100 of less than 800 hp., 50 of 801-2,000 hp., and 160 of over 2,000 hp.

General aviation aircraft with weather radar numbered 180, 20 of them being twins of less than 2,000 hp.

The FAA report contains detailed analysis from a survey, is titled "General Aviation Aircraft Radio Equipment, 1958," and is available for 20 cents from the Government Printing Office, Washington 25, D. C.

Two passengers from a little Cessna 180 bush plane are pictured boarding a States-bound Alaska Airlines DC-6C on the Anchorage ramp. The 49th State is served by 11 certificated airlines with 22 communities receiving scheduled air service.

—(Alaska Airlines Photo.)

Air Service In Alaska

By E. H. PICKERING

THE airlines serving Alaska have got a bear by the tail — not any li'l 'ole two-bit bear, but a real Kodiak-type. With statehood, Alaska is growing by leaps and bounds; there'll be no holding it. So will its vital air transportation grow. From what we saw and heard on a recent air tour of Alaska, it will be no easy-going lope to keep up with this particular bear; it will vigorously swish from side to side, and the airline that zigs when this bear zags may never catch up again.

Most bears don't tolerate riders with a tail-hold, but Alaska wants and needs its airlines. Unlike the original 48 states, which would be but frustrated and handicapped by a sudden loss of airline service, Alaska's commerce would grind to an immediate halt without air service. Surface transport to and from the States takes 3.5 to 5 days by the only road (the Alaska Highway), 10 days by boat from Seattle, and there is no connecting railroad at all. Within Alaska there are only 3,600 miles of highways (barely enough to reach across the state if stretched out in a single road) as compared to over 8,000 miles of airways, and only a single rail line extending from Seward to Anchorage to Fairbanks. Probably 90% of Alaska's cities and towns have no highway entrance, possibly half have access to navigable waters but then only during a few summer months, but all have service by one or more of the eleven CAB certificated airlines providing service to and within Alaska.

Intra-Alaska service has no great frequency of service although provided with DC-6C's by Alaska Airlines, Boeing Strato-Clippers by Pan American, Fairchild prop-jet F-27's by Wien Alaska and Northern Consolidated, and Lockheed Constellations by Pacific Northern at one end of the scale (and at the other end runs all of the way down to 4-place Cessnas). No more than two daily round trips are consistently scheduled between any two cities in Alaska, and the range is downward to schedules reading "1st and 3rd Saturdays."

The Official Airline Guide lists 222 cities and towns (and villages) in Alaska receiving airline service, of which 25 are served by more than one airline. One, Anchorage, is a port of call for KLM, Northwest, SAS and Japan on trans-Arctic international routes, as well as for five of Alaska's own airlines.

This, then, is the scheduled airline industry of and for Alaska. Not only must it grow as Alaska grows, but it must also lead Alaska's growth. It must follow a very narrow course, providing enough service to avoid being a handicap to growth (preferably leading the growth enough to be a stimulant), but never over-producing because it is a subsidized service and for years to come will continue to be. In other words, the airlines must be able to sense every zig and zag of the bear's tail. This is tough enough with a tame bear, but Alaska's boom is no tame bear; it's a sure enough Kodiak variety, exuberantly youthful.

Statehood Benefits and Problems

Probably the most immediately serious problem facing the airlines of Alaska stems from the very statehood that brings their greatest opportunity, for statehood robs them of much of the protection that a benevolent government provided while Alaska was a territory. Today, these airlines are both raised and lowered to the level of all other domestic airlines. They now face Washington and Wall Street on the same footing and in the same competitive fashion as all other U. S. airlines. This is good, as it eliminates many handicaps, but it also leaves them vulnerable to a potential competition not encountered by U. S. airlines anywhere but in Alaska.

With competitive surface transportation generally non-existent, with distances great and with thin traffic flows, with costs roughly 30% to 50%

higher than in the outside states, airline fares within Alaska average roughly 12¢ per mile, nearly double the rates in the original 48 states. At 12¢ per passenger mile, the owner of almost any airplane that can carry three or more passengers stands to make a little profit if he can set up operations over a route that will provide him with a good average load. When Alaska was a territory, the CAB would not permit such scheduled operations without certification, and they were not handing out more certificates. Now that Alaska is a state, the CAB has no jurisdiction over routes operated within the state. Without having to meet the stringent requirements established by CAB and FAA for certificated scheduled operations, small-scale operations should be able to scratch out a living in competition with the certificated lines. To the certificated industry this competition can be likened to a person supporting himself and a herd of tapeworms — debilitating, to say the least.

As a state, Alaska is aware of this problem. Commissioner of Commerce A. H. Romick in Juneau has set the machinery in motion with an investigation and hearings in the matter. These hearings are now under way. Alaska may limit operations by non-federally certificated airlines, or it may decide to permit certain state-certificated operations, or it may wash its hands of the entire problem. Meanwhile, the problem is a red-hot subject in Alaskan aviation circles.

Most of the industry problems can be exemplified by an analysis of one of Alaska's airlines, one that is representative in that it is thoroughly a part of all three Alaskan services — bush operations, intra-Alaska services, and States-Alaska business. Such an example is Alaska Airlines, Inc., which serves 60 Alaska cities and villages plus operating daily service between Portland/Seattle and Fairbanks/Anchorage.

Alaska Airlines was born as Star Air Service in 1932. It has grown by merger and purchase and new route awards. It has matured by virtue of hard times, heady periods of comparative plenty, bitterly learned mistakes, and has just emerged from the severest handicap of all, internal strife in ownership. In all, or most, of these experiences Alaska Airlines is representative of other of Alaska's air carriers. They have all known very hard going, are having no picnic today, and will continue to know rough times. But the hardiness of Alaska itself has given them and will continue to give them the temper to overcome the rough spots.

Four Kinds of Passengers

Alaska Airlines' passenger traffic falls into four categories: first and foremost, the people of Alaska traveling on their daily business and social journeys within Alaska and to and from the Outside; second, general business travel of people from the Outside, the engineers, salemen, commercial fishermen, non-defense governmental personnel, and in ever-increasing numbers the oil people (over $300,000,000 is reportedly known to be committed for oil exploration and development in Alaska); third largest group is the tourists and sportsmen (this is the class where the greatest growth is not only anticipated, but encouraged through advertising and sales efforts), and last, travel of the military concerned with Alaska's air and Army bases, and with DEW line installation and operation (this group might well become largest of all if operations of Military Air Transport Service should be curtailed).

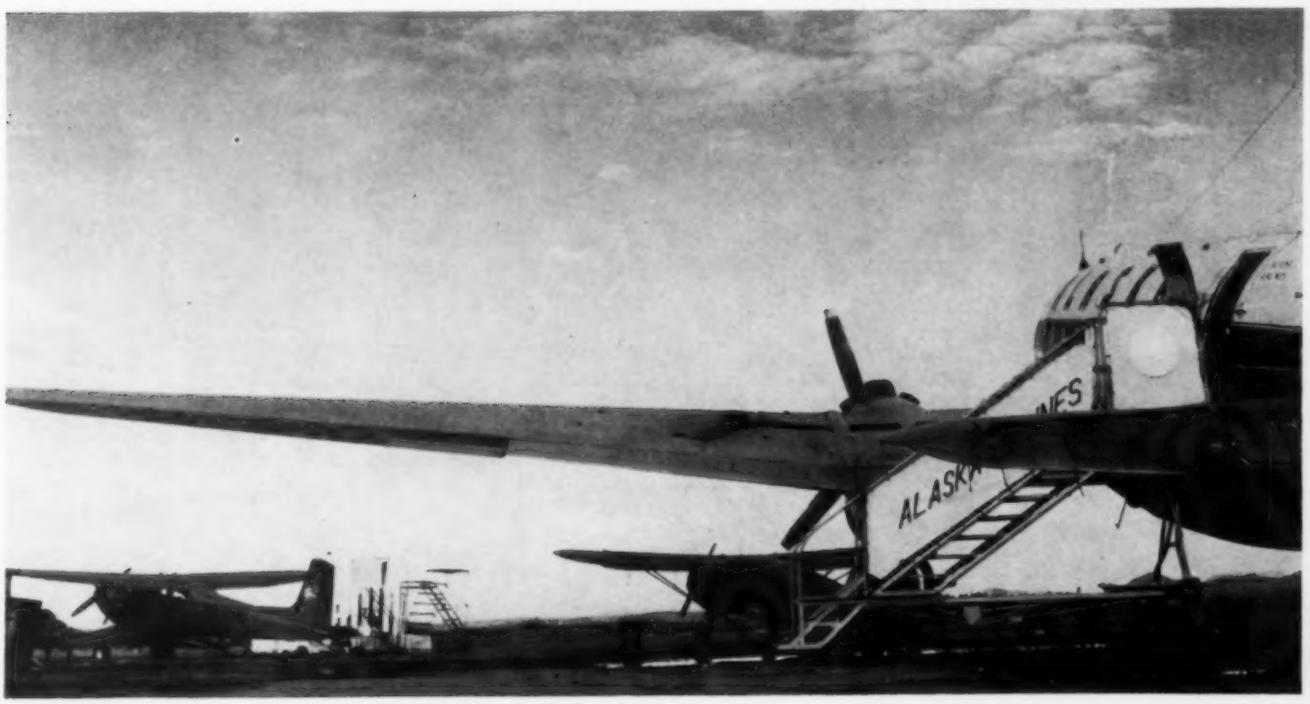
Everyone in Alaska flies. The airlines operate a sizeable airlift each spring and fall, collecting school children by bush plane from native villages each fall, congregating them at collection points, and airlifting them by regularly scheduled flights to their schools (operated by the Alaska Native Service of the Department of the Interior.) In the spring, the operation runs in reverse.

Alaska Airlines' records show that of nearly 60,000 passengers carried in scheduled services during the year ending June 30, 1959, over two-thirds were carried on flights between the 60- some Alaskan points that Alaska Airlines serves. In States-Alaska service, this airline carried nearly 14,000 passengers. Bush operations of the airline carried over 5,000 passengers to

(Continued on page 70)

Here's the ramp at McGrath, in the interior of Alaska, junction point between Curtiss C-46's, Fairchild F-27's, Douglas DC-4's and bush planes such as the Cessna 180 and Noorduyn Norseman shown with this Curtiss.

—(FLIGHT MAGAZINE Photo by E. H. Pickering.)



THE FIRST IN A SERIES
FOR YOUR
AIRCRAFT COMPARISON FILES...TEAR OUT →

THE COMPLETE STORY OF THE NEW FLIGHT\SWEEP CESSNA 210

the next best thing to taking a demonstration flight!

NEWEST OF THE GREAT NEW NINE

Cessna and only Cessna offers the first and only single-engine commercial airplane with high-stability wing and retractable landing gear

A quiet look of good taste enriched by the finest leathers, fabrics, carpetings, and trim materials — appropriately fashion-fits the all-new 210 for top-level executive travel and transport.

Featuring two classically beautiful interior color choices . . . cay coral and aquamarine interwoven with gold mylar, the 210 also offers spacious "polycloud" seating of immediate softness and underlying firmness. Thick, luxurious cabin floor carpeting applied over one-half inch thick, soft polyester pad and "sound-soaking" mat provides vibrationless conference-room quietness. Molded Royalite luggage compartment in matching interior colors provides large, functional storage space. Convenience is added to comfort with extra long front and rear seat arm rests . . . optional, automatically adjustable head rests . . . ash trays, cigarette lighters . . . front and rear "envelope" map pockets . . . rear utility "hammock" shelf . . . contoured sun visors . . and an exciting array of other interior appointments . . . marking the newest of the Great New Cessna Nine as the plane for men going places!

HANDSOMELY HANDCRAFTED FOR ROOM-TO-SPARE COMFORT AND CONVENIENCE

CAY CORAL

Stretch-out spaciousness / sealed-in quietness / for the most relaxing ride in the sky.

all new 210, top of the mark in single engine performance, power, prestige

AQUAMARINE

Cabin design provides extra leg room for maximum **stretch-out freedom** . . . also allows plenty of elbow and shoulder room plus excellent forward and side visibility! Low cabin floor permits easy "walk-in" entrance to both front and rear seats with head clearance to spare!

Outside access to baggage compartment is through an oversized door. Activation of latch automatically swings door open to a full up position against the fuselage. Baggage floor height and door position provides maximum loading ease for 120-pound luggage payload . . . Baggage door is big enough to load stretcher patients when used as ambulance ship.

The deep sculptured comfort of "posture padded" seating is complemented by easy in-flight, three-position adjustment of rear seats — provides opportunity for restful, semi-reclining positions during long flights.

PERFORMANCE AND SPECIFICATIONS

GROSS WEIGHT	2900 lbs.
SPEED: BEST POWER MIXTURE	
Maximum at Sea Level	199 mph
Maximum Recommended Cruise, 75% Power at 7000 feet	190 mph
70% Power at 8000 feet	187 mph
RANGE: NORMAL LEAN MIXTURE	
Maximum Recommended Cruise, 75% Power at 7000 feet	755 miles
55 Gallons, No Reserve	4.0 hours 188 mph
70% Power at 8000 feet	780 miles 4.2 hours 186 mph
Maximum Range at 10,000 feet	1100 miles
55 Gallons, No Reserve	8.0 hours 137 mph
RATE OF CLIMB AT SEA LEVEL	1300 fpm
SERVICE CEILING	20,700 ft.
TAKE-OFF:	
Ground Run	740 ft.
Total Distance Over 50-foot Obstacle	1135 ft.
LANDING:	
Landing Roll	520 ft.
Total Distance Over 50-foot Obstacle	1190 ft.
EMPTY WEIGHT	1735 lbs.
BAGGAGE	120 lbs.
WING LOADING: Pounds per square foot	16.5 lbs.
POWER LOADING: Pounds/HP	11.2 lbs.
FUEL CAPACITY: Total	65 gals.
OIL CAPACITY: Total	12 qts.

POWER: Continental 6-cylinder, Fuel Injection IO-470-E Engine, 260 rated HP at 2625 RPM

PROPELLER: Constant Speed. Choice of: McCauley or Hartzell 2A36C33/90M-8 — HC-A2XF-1/8433-2

WING SPAN — 36 feet, 6 inches
LENGTH — 27 feet, 4 inches
WING AREA — 175.5 square feet
HEIGHT — 8.15 feet

Specifications subject to change without notice

STANDARD EQUIPMENT

INSTRUMENTATION
- Airspeed Indicator
- Clock
- Cylinder Head Temperature Gauge
- Flap Position Indicator
- Fuel Pressure Gauge
- Generator Charging Light
- Instrument Panel Lights (Rheostat Controlled)
- Landing Gear Warning Horn
- Lighted Magnetic Compass (Rheostat Controlled)
- Manifold Pressure Gauge
- Oil Pressure Gauge
- Oil Temperature Gauge
- Recording Tachometer
- Sensitive Altimeter
- Shock-Mounted Instrument Panel
- Space for Optional Instruments
- Stall Warning Horn
- Turn and Bank Indicator
- Two Fuel Quantity Gauges
- Vertical Speed Indicator

CABIN EQUIPMENT
- Adjustable Fore and Aft and Tilting Front Seats
- Adjustable and Removable Rear Seat
- Adjustable Sunshades
- Armrests (Four)
- Ash Trays (Four Individual)
- Assist Straps
- Cabin Heater and Defroster Control
- Cigarette Lighter
- Control Lock
- Cowl Flap Control
- Elevator Trim and Indicator
- Foam Filled Seat Cushions
- Front and Rear Seat Ventilators
- Fuel Selector Valve (Three Position)
- Glove Compartment
- Inside Control for Strainer Drain
- Instrument Panel Map Compartment
- Key-Operated Door Lock
- Key-Operated Ignition
- Landing Gear Position Lights
- Magazine-Map Pockets (Back of Front Seats)
- Outside Baggage Door
- Parking Brake
- Rudder Trim and Indicator
- Suit Hanger
- Tinted Windshield and Cabin Windows
- Utility Shelf
- Ventilation Control
- Vernier Mixture Control
- Vernier Propeller Control
- Vernier Throttle Control
- Wall-to-Wall Carpet
- Windshield Defroster

ELECTRICAL
- 35-Amp. Generator and Voltage Regulator
- Cabin Radio Speaker
- Circuit Breakers
- Dome Light
- Headphone and Mike Jacks
- Landing Lights (Two)
- Navigation Lights and Flasher
- Push-Button Starter
- Two Electric Auxiliary Fuel Pumps
- 12-Volt Electrical System

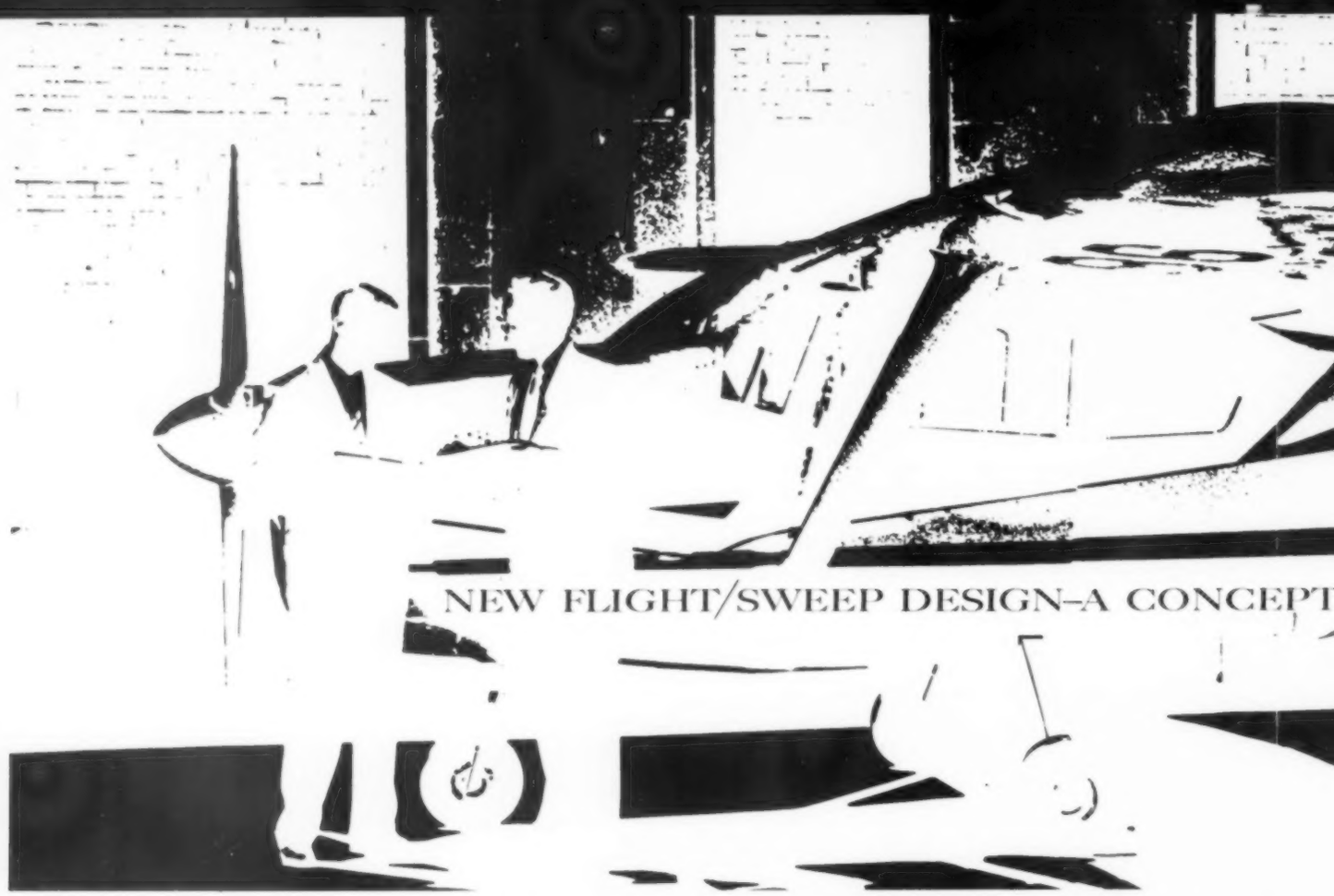
ENGINE
- All-Metal, Constant-Speed Propeller (Your Choice of McCauley or Hartzell)
- Carburetor Heater
- Engine Ignition Shielding
- Cowl Flaps
- Dual Magnetos
- Induction Air Filter
- One Engine-Driven Fuel Pump
- Propeller Spinner
- Stainless Steel Mufflers and Heaters

GENERAL
- Anti-Ice Fuel Vent
- Easy Access Step
- Hydraulic Brakes (Toe Operated)
- Key-Operated Baggage Door Lock
- Landomatic Hydraulically Operated Landing Gear
- Manual Emergency Hand Pump for Landing Gear
- Outside Baggage Compartment Door
- Para-Lift Hydraulically Operated Flap System
- Retractable Tie Down Rings
- Sound Proofing
- Steerable Nose Wheel
- Strut Speed Fairings
- Tow Bar

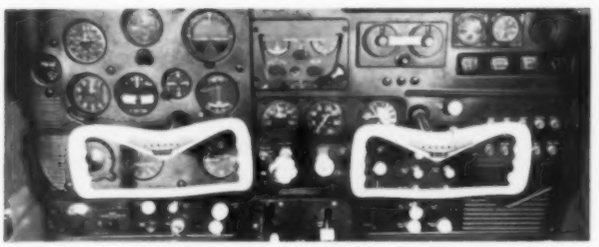
NO MATTER WHAT YOUR LINE... You can "profit IMPROVE" your business future with the all-new 210! Today, thousands of men on their way up in business own and fly their own Cessna's. Now the all-new 210 adds new striking power in single-engine range . . . power . . . and payload . . . new flying ease . . . new comfort and convenience . . . new flight/sweep styling — a new way to profit IMPROVE business futures!

Designed by Cessna because it was asked for, the 210 provides all the things needed to meet the rigorous tests of full range market exploration and expansion. The 210 offers new highs in single-engine performance *but retains the excellent ground-handling characteristics and ease of control "in-flight" characteristic of lower performance airplanes!* Equipped with the complete advantages of high-stability wing safety, retractable landing gear, luxury plane styling . . . the 210 provides modern business with a great new key to travel-mobility and to progress . . . so compare and

fly Cessna

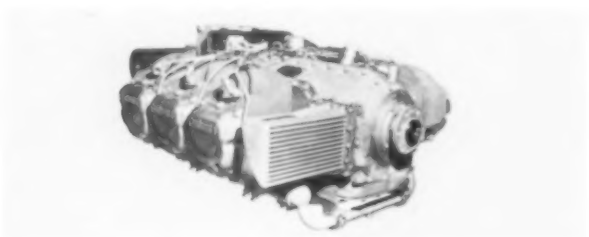


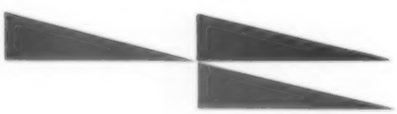
POWER-TO-SPARE ENGINE . . . SIMPLIFIED FUEL INJECTION SYSTEM
The minute you turn up the engine of the all-new 210 you'll experience a smooth, swift surge of power . . . power that adds new speed, range, and performance to the single-engine airplane field! Equipped with a big, 260-HP, six-cylinder, air-cooled Continental engine, the 210 powerplant also includes the outstanding feature of fuel injection . . . a unique continuous flow system offering the most in performance, simplicity, safety, reliability, and ease of maintenance of any fuel injection system available today! It provides each cylinder with **precisely** the right amount of properly proportioned fuel-air mixture to materially improve the horsepower output per engine weight and per pound of fuel . . . resulting in smoother running engine and substantial fuel savings . . . actually permits in-flight "fuel management" for maximum efficiency!

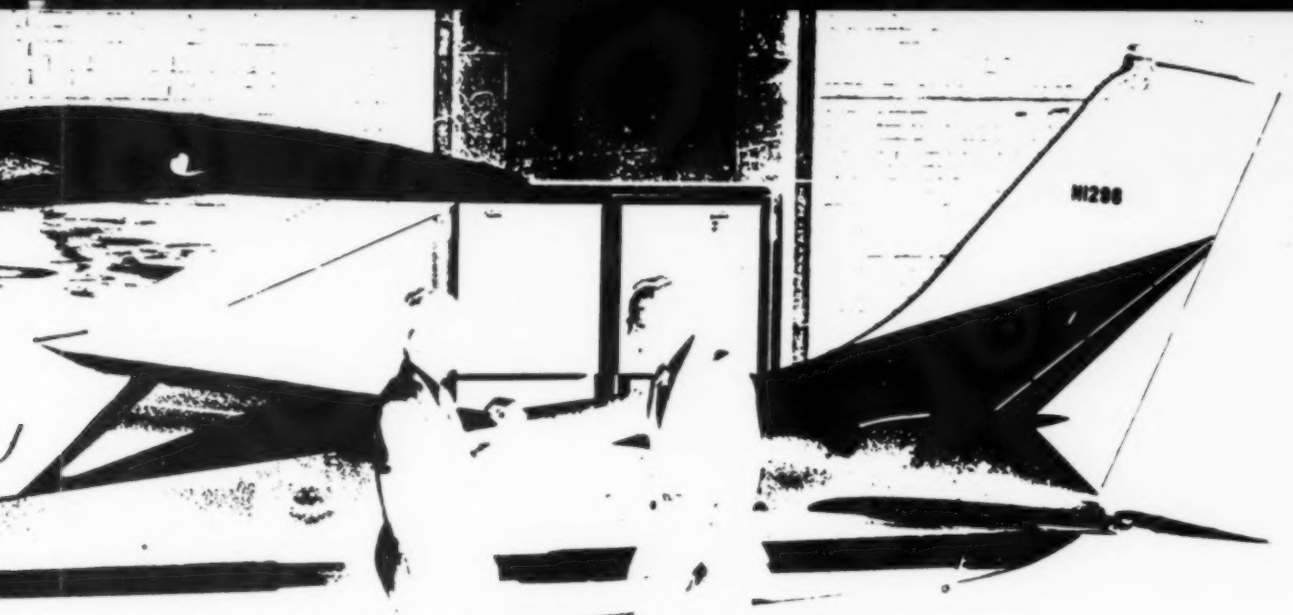


Large, well-lighted "flight command" instrument panel with navigation instruments and engine controls grouped for "eyes-on-the-road" operation and inspection . . . assures easy visibility . . . easy operation. Engine controls are of vernier type, minute control of power, propeller and mixture settings.

All-metal, high-stability wing design provides for high lift, low drag characteristics . . . exclusive conical camber wing tip is provided for added stability and safety.







CEPT IN KEEPING WITH TOMORROW!

Exclusive new 210 cowling design featuring a fixed lower cowl and a "split" upper cowl with flush mounted "cam-loc" fasteners. Withstands high speeds, is lightweight and quickly removable for engine maintenance.

The Model 210 is equipped with flight/sweep fin and rudder . . . which add to its graceful, "silhouette in motion" lines... provides greater longitudinal stability . . . gives the 210 the great new Cessna "GO" look for Sixty!

Complete feather-touch trim controls for rudder, elevator, and ailerons are in easy reach of the pilot. A slight turn of the trim control sets the control surfaces . . . eliminates the need for constant control pressures.

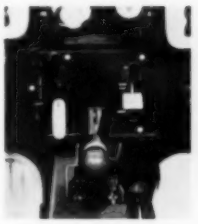
Big, power-to-spare Continental engine is equipped with an anti-dust induction air system with provisions for heated alternate air as added anti-ice safety precaution.

Exclusive Cessna Para-Lift hydraulically lowered flaps provide short-field operations for the all-new 210. Big, mechanically synchronized and interconnected Para-Lift flaps may be lowered or raised to any desired position by a smoothly functioning hydraulically actuated system.

Airline-type ventilation and heating ducts located above and to the sides both fore and aft give each person aboard the all-new 210 personalized comfort control . . . and a climate conditioned to individual needs and tastes!

The fabulous feature of the all-new Model 210 is its positive action, fully retractable Land-O-Matic landing gear. Gear is completely concealed whether up or down . . . provides sleek full flight/sweep configuration. Ground safety switch prevents inadvertent retracting of gear.

Wing lift strut fillets fairs the wing strut smoothly into the wing and fuselage to reduce drag and increase speed. The all-new 210 also features fully retractable tie-down rings, jack points, and anti-ice fuel vents.



Hydraulic power-pac control for gear and flap systems features simplified "press-to-test" position indicator warning for gear and flaps . . . control handles are in the shape of a wheel or a flap for easy "touch" identification.

now...from cessna...all the complete advantages of high stability wing, plus positive action fully retractable land-o-matic gear, plus simplified fuel injection.

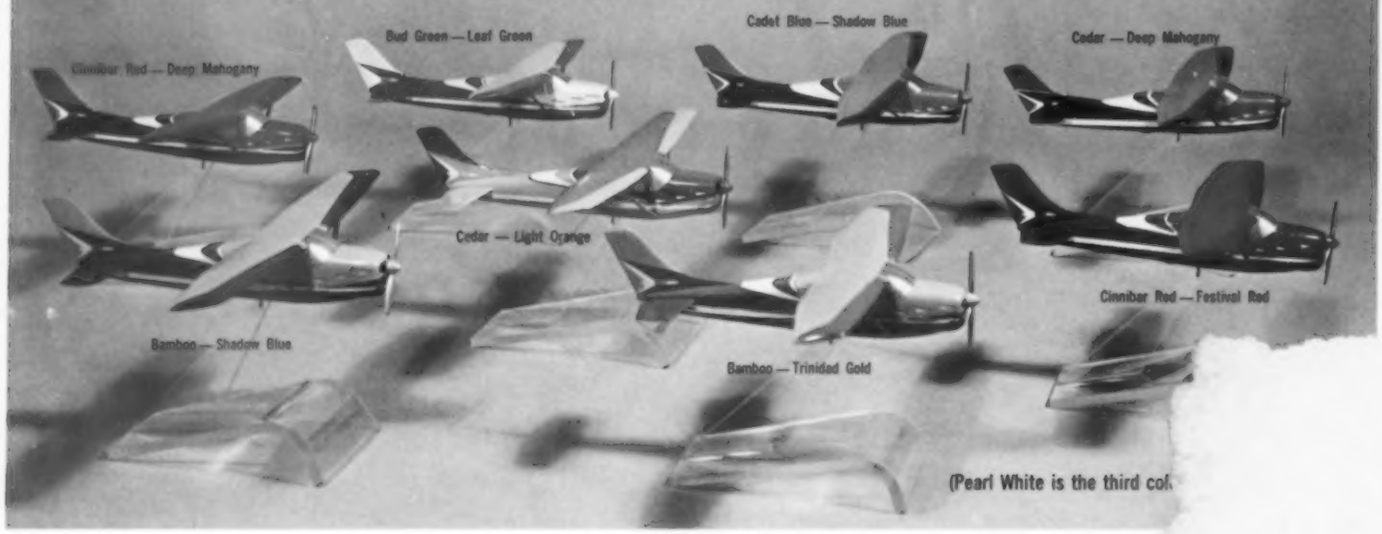
The all-new Cessna 210 perfectly fills the need and the speed requirements / of modern businessmen / The big, power-to-spare, 260-HP engine / with simplified fuel injection / provides a smooth, safe, cruise speed of 190 mph / extra "spare-nothing" elegance in interior material selection and handcrafted styling adds comfort, convenience, and a fabulous feeling of fly-away freedom to / a host of modern flight-ease features / all of which makes the all-new 210 the most complete / the most wanted / package of single-engine power / performance / and prestige / available today!

built to fill a need in your flying future

Cessna

210

EIGHT FULL COLOR COMBINATIONS Featuring eight three-color combinations in rich, durable vinyl, the fully painted 210 is available in the below flight/sweep colors:


Cinnibar Red — Deep Mahogany
Bud Green — Leaf Green
Cadet Blue — Shadow Blue
Cedar — Deep Mahogany
Cedar — Light Orange
Cinnibar Red — Festival Red
Bamboo — Shadow Blue
Bamboo — Trinidad Gold
(Pearl White is the third col

FREE V. P. M. ANALYSIS : V. P. M. — Value Per Mile — simply means the **cents per mile your company can economically justify for a business airplane.**

With the answers to seven simple travel questions, our representative can provide a Value Per Mile Analysis for your company. You can actually see an accurate study of how much farther and faster you can travel in a Cessna . . . and how little it will cost! No obligation, of course.

FINANCING Cessna dealers offer a convenient, practical financing program. Your Cessna dealer has all the details and can arrange financing terms for you quickly and easily. Lease plans are also available.

RENT-A-PLANE Rent a plane just like you rent a car. Fly yourself or with pilot provided. Available nationally. Call your Cessna dealer for complete details.

COOPERATIVE OWNERSHIP Popular among some profe... business men is the associate plan for cooperative airp... ship. This program provides practical and economical ... small groups where the individual needs do not justify sole owner-ship. Ask your Cessna dealer about group ownership.

LEARN TO FLY AS YOU TRAVEL Your Cessna dealer ... for learning to fly to fit your need and schedule. Po... businessmen is the "Learn-to-fly-as-you-travel" plan. You'll be amazed at how economical it is. You can take an instructor along and actually learn to fly without interference with ... work schedules.

WORLD-WIDE SALES AND SERVICE You'll find Cessna "service stations" strategically located for your comfort and convenience. Your Cessna dealer is able to serve your every need in a friendly and competent manner. He is factory trained and equipped to provide expert and economical servicing. The "sign of the Cessna pennant" is your invitation to a new and pleasant future in the air.

Cessna® AIRCRAFT COMPANY · WICHITA, KANSAS

CESSNA'S GREAT NEW NINE

SPA-435 Litho. in U. S. A.

AUTHORIZED
Cessna
SERVICE

Your Cessna is always ready to go

when you depend on the factory authorized Cessna Service Centers listed below.

Th[illegible]na dealer displaying [illegible]y authorized service [illegible] resents a symbol for fri[illegible]ss, hospitality and expert Ce[illegible]na service featuring

factory-trained mechanics . . .

factory-approved equipment . . .

and a complete stock of genuine factory parts.

Make the most of your Cessna's usefulness by depending on the Authorized Cessna Service Centers listed for assurance that your airplane is always ready to go, always in top condition for reliability, performance and comfort.

AIRNEWS, INC.
260 E. Terminal Drive
San Antonio, Texas

The Air-Oasis Co.
3353 Lakewood Boulevard
Long Beach 8, Calif.

Aircraft Sales Company
Gregg County Airport
Longview, Texas
Meacham Field
Fort Worth, Texas

Champ's Aviation, Inc.
Municipal Airport
El Paso and Lubbock, Texas

Clinton Aviation Company
Stapleton Airfield
Denver, Colorado

Coastal Aviation, Inc.
4906 Tampa Bay Blvd.
Tampa International Airport
Tampa 3, Florida

Cruse Aviation, Inc.
International Airport
Houston, Texas

Dal-Tex Aviation, Inc.
Addison Airport
Addison, Texas (Dallas)

Executive Aircaft Company
701 Perimeter Road
Kansas City, Missouri

Lynch Flying Service, Inc.
Logan Field Box 1575
Billings, Montana

Macon Air Service, Inc.
P. O. Box 2036
Macon, Ga.

Midwestern Aero Service, Inc.
Southern Illinois Airport
Carbondale, Illinois

Poelman Aircraft Co.
New Orleans Airport
New Orleans, Louisiana

Ragsdale Flying Service
Municipal Airport
Austin, Texas

Skyways
Hastings and Grand Island
In Central Nebraska

Southwestern Skyways, Inc.
Municipal Airport
Santa Fe, New Mexico
and Ogden, Utah

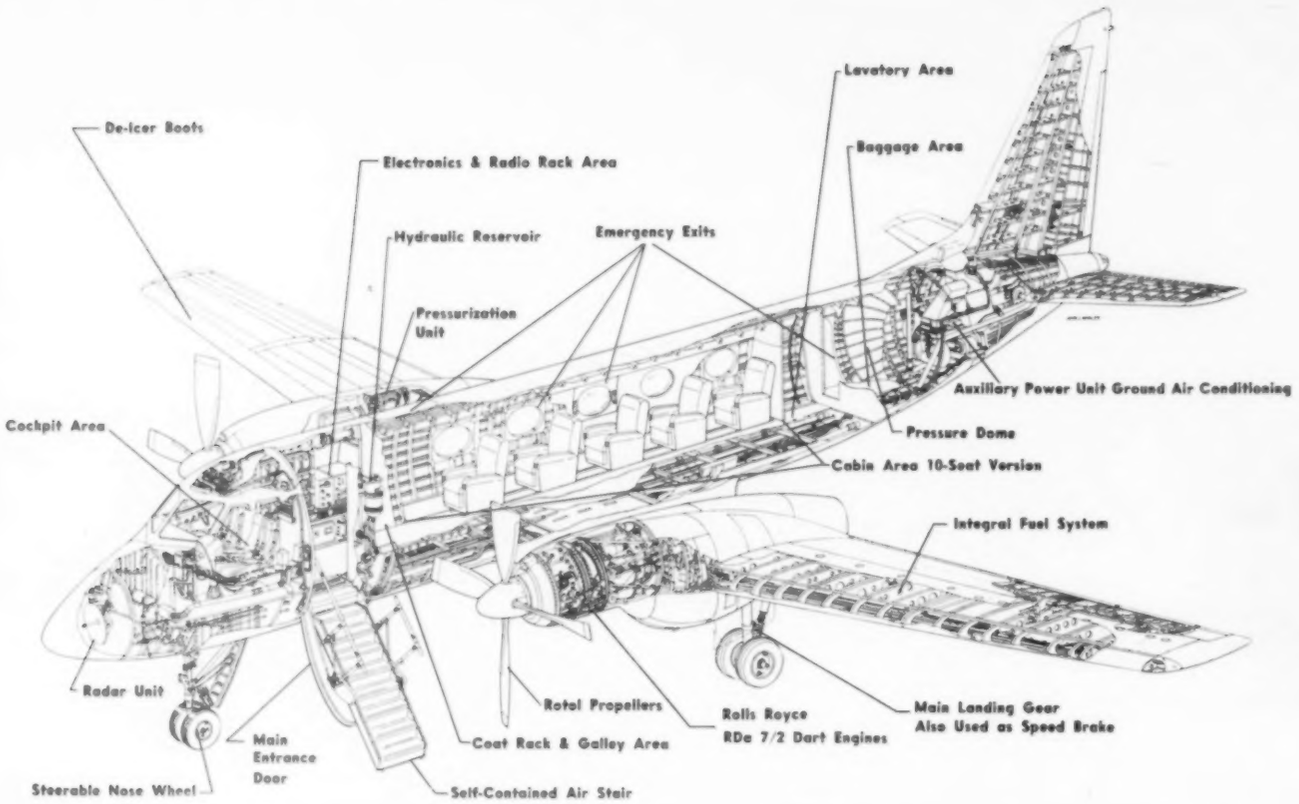
Kenneth Starnes Aviation Service
Adams Field
Little Rock, Arkansas

Sunny South Aircraft Service, Inc.
Broward International Airport
Fort Lauderdale, Florida

Walston Aviation, Inc.
Civic Memorial Airport
East Alton, Illinois

Wings, Inc.
Wings Field
Philadelphia 18, Pa.

Yingling Aircraft, Inc.
Municipal Airport
Wichita, Kansas



Gulfstream Executive Fleet Growing

MORE than 27 Grumman Gulfstreams have been delivered to corporate purchasers, pushing deliveries past the halfway point with about 20 more to go to customers from orders already on hand. Additional sales are being booked through four distributors — Atlantic Aviation, Wilmington; Southwest Airmotive, Dallas; Pacific Airmotive, Burbank, and Timmins Aviation, Montreal. Deliveries were running at a rate of about 4 Gulfstreams per month at year's end.

Continental Oil at Houston has received delivery of its Gulfstream after it was outfitted with a custom interior by AiResearch Aviation Service at Los Angeles. It seats 9 passengers, six in new-type Burns Seat Co. swivel and reclining chairs, and three on a divan convertible into a sleeping berth. A partial bulkhead with curtains divides the cabin into two compartments. Interior colors are brown, beige and aqua, with exterior paint of white and green with red trim. AiResearch also installed electronics, radar, autopilot and custom cockpit panels. —(AiResearch Photo.)

Minneapolis Star and Tribune's new Gulfstream was delivered recently by Southwest Airmotive in Dallas with electronics installation by Associated Radio and interior by Horton & Horton of Ft. Worth. Shown with it is Stanley Hawks, Star-Tribune vice president.
—(Horton & Horton Photo.)

Atlantic Aviation at Wilmington has delivered two of 11 Grumman Gulfstreams it has sold. Custom cockpit and cabin installations by Atlantic are shown above. Weight of its first Gulfstream delivery allows full 9-passenger load with crew and fuel for 1,700-mile trip plus approach and alternate airport requirements. Equipment included VHF transmitters (with SCS-DCS switching) and receivers, HF transceiver, dual VHF navigation receivers, dual ADF's, dual Gyrosyn compasses, dual RMI's with cross-switching of ADF-VOR birddogs, dual glideslope receivers and a marker beacon receiver, weather radar, autopilot system for completely automatic flight control, and separate audio-transmit selector panel with individual master audio control for each pilot.

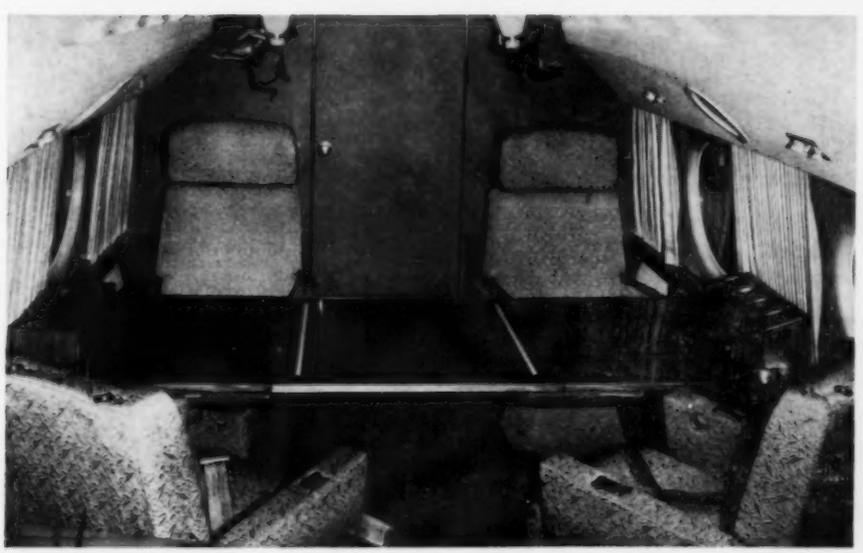
—(Atlantic Aviation Photos.)

Customers receive their pressurized Gulfstreams bare, arranging for custom installations through Grumman distributors. Base-priced just under $900,000, Gulfstreams average a little over $1,000,000 each after customizing to fit the needs of individual purchasers. They cruise 357 mph.

(Continued on page 68)

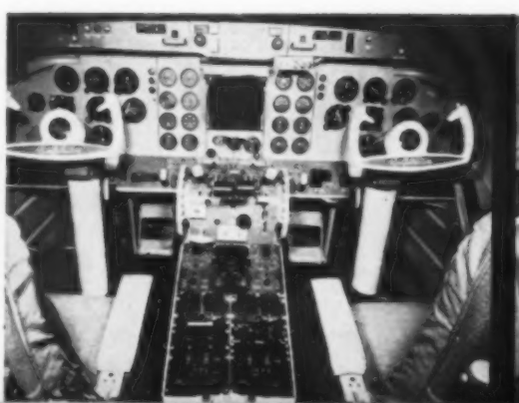
Pacific Airmotive at Burbank customized first Gulfstream delivered to any customer, and its interior is pictured in these three photos. Reclining swivel chairs are in sea green matelasse, with fiberglass draperies in same color while walnut Formica cabinets, desks and folding tables harmonize with brown nylon carpet (over 3/8-in. plastic foam). Bulkheads are of green vinyl, and oyster-white headliner and mist-green wainscoting are of linen-finish vinyl. Hardware is gold anodized. Note indirect lighting.

—(Pacific Airmotive Photos.)



YOU ARE INVITED to inspect the Gulfstream and arrange for demonstration flights through one of the following distributors: Atlantic Aviation, Wilmington, Delaware; Southwest Airmotive, Dallas, Texas; Pacific Airmotive, Burbank, California; Timmins Aviation, Montreal.

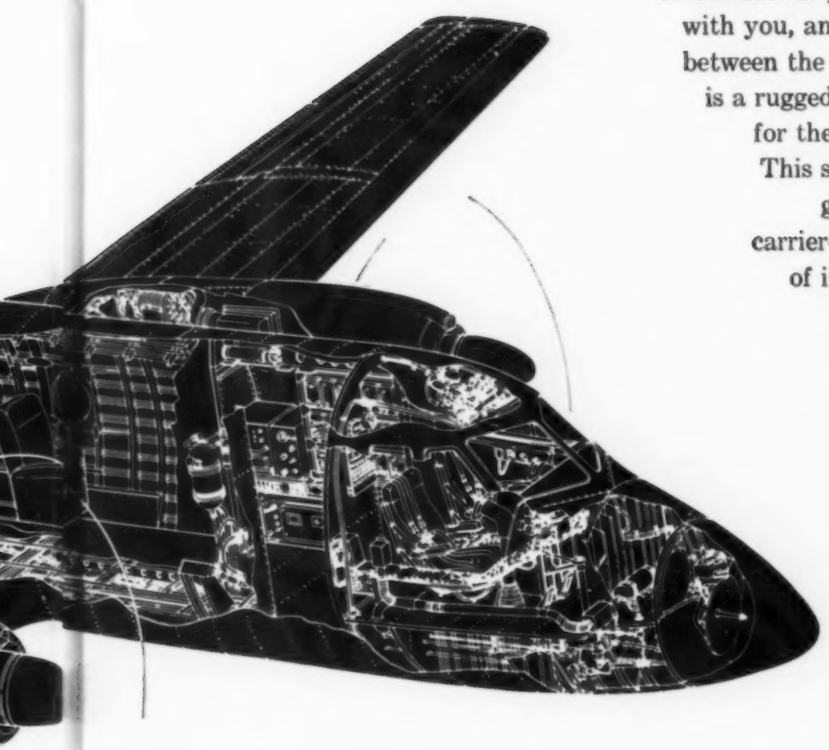
Instrumentation, including the most up-to-date and sophisticated communication, navigation and radio equipment, is custom built into the Gulfstream by these distributors. Custom cabin interiors are fitted to customer specifications. Illustration shows how one Gulfstream owner decorated the aircraft's interior.



Beauty...is more than skin deep

The beauty of any business airplane must be weighed against its past. If it is a "re-do" of an older airplane, the structural stress and strain of years of operation may be invisible today, critical tomorrow. The business airplane must be qualified to meet the stringent licensing requirements demanded by today's—and tomorrow's—all-weather and high density traffic conditions.

A business airplane, like the Grumman Gulfstream, *starts new* with you, and has beauty more than skin deep. Sandwiched between the Gulfstream's clean exterior and custom interior is a rugged Grumman structure built to withstand fatigue for the equivalent of more than 50 years of operation. This structure is based on the most recent knowledge gained from designing supersonic, and especially carrier-based aircraft, required to withstand the rigors of in-fleet service. Within the Gulfstream's nacelles are two Dart turbo-prop engines, their famous Rolls-Royce reliability proven by millions of airline flight hours.



When you select the Gulfstream you get an airplane, new from nose to tail, conceived and engineered by Grumman for today's business flying operations, in terms of performance, utility, reliability, and all-weather safety.

GRUMMAN

AIRCRAFT ENGINEERING CORPORATION

Bethpage • Long Island • New York

THIS SAFETY MESSAGE CAN SAVE YOUR LIFE

By The Civil Aeronautics Board

IT is unfortunate that vortices are invisible. If they could be seen they would look like a pair of horizontal tornadoes stretching back from each wing tip. For miles astern these compact and fast-spinning air masses stay close together and parallel, sometimes undulating slightly, as a pair. They gradually weaken and die but can remain dangerous until their birthplace is far out of sight. Because the real hazard can be many miles astern and since it is not thick nor wide, the probability of running into this insidious danger by chance is extremely slim. However, the result is sure to be startling and may be lethal.

The intensity of the vortex is directly related to span loading and inversely related to airspeed; however, it is a safe and practical generalization that the bigger the ship the more violent and longlived will be the vortex disturbance. Technically, the faster the plane is moving the less energy it casts off. The more it weighs in relation to its span, the greater will be its trailing danger. Also, the blows (the airloads) felt on piercing a vortex depend on the speed of entry. At half the speed the shock would be only one-fourth as great.

What You Can Do For Safety

Don't pass close behind any other aircraft; the bigger it is the more time it should be given. Two minutes should suffice as a working rule.

Avoid, when possible, places and altitudes frequented by large aircraft. Areas near high density airports, whether civil or military, should always be suspect.

If you are to pass behind a crossing aircraft, change altitude so that you will be at least 100 feet higher or lower, preferably higher, and slow down.

If you do get into a bad vortex, your best procedure is to ignore altitude changes and use no elevator control.

Vortex Turbulence -- Unseen Killer

LOCAL pilots at Dover, Delaware, avoid the area around the nearby Kenton VOR station because of considerable and frequent turbulence in that vicinity — extremely rough vortices trailing back unseen from heavy military transports based at nearby Dover Air Force Base. These big aircraft, Douglas C-124's and Lockheed C-130's, use Kenton VOR as a navigational and letdown aid during proficiency flights and turbulence from their wingtip vortices is especially heavy at altitudes around 1,500 to 2,000 ft. above the ground.

But transient civil airmen, especially those flying VFR, do not know about Kenton VOR's man-made turbulence — airmen like William W. Miller, 31, who came up on Kenton VOR in Piper PA-22 N-2945P en route from Zahn's Airport, Amityville, N. Y., to Charlottesville, Virginia. It was a beautiful day on September 23, 1958, about 2 p. m. and there was little or no wind as Miller sailed along serenely at about 2,000 ft.

Suddenly, with no other aircraft in sight and without warning, Miller's Piper broke up in mid-air, and the pilot became a statistic with the wreckage of his airplane plummeting to earth about 1 mile from the same Kenton VOR which local pilots avoid like the plague.

Mr. Miller's estate petitioned the Civil Aeronautics Board to investigate his fatal accident and the Board recently made public its findings: "The aircraft was subjected to aerodynamic overloads causing failure of the primary structure. Evidence strongly indicates that the overload was caused by the destructively energetic vortex in the wake of a large aircraft."

Neither Mr. Miller's piloting ability nor Piper N-2945P's structural integrity and airworthiness was faulty and the weather was "excellent." Miller was known as a safe, cautious pilot and his airplane was maintained in keeping with good and accepted standards.

"Violent artificial turbulence produced by aircraft having high span loading is the only plausible explanation," the CAB accident report states. "First, the accident area was being traversed repeatedly by large military aircraft at the Piper's altitude. The wind was light, allowing longer life to the wakes of these aircraft. Second, the nature of the failure — its remarkable similarity on right and left sides — can only be explained by violent downloads to both wings applied simultaneously, causing simultaneous failures."

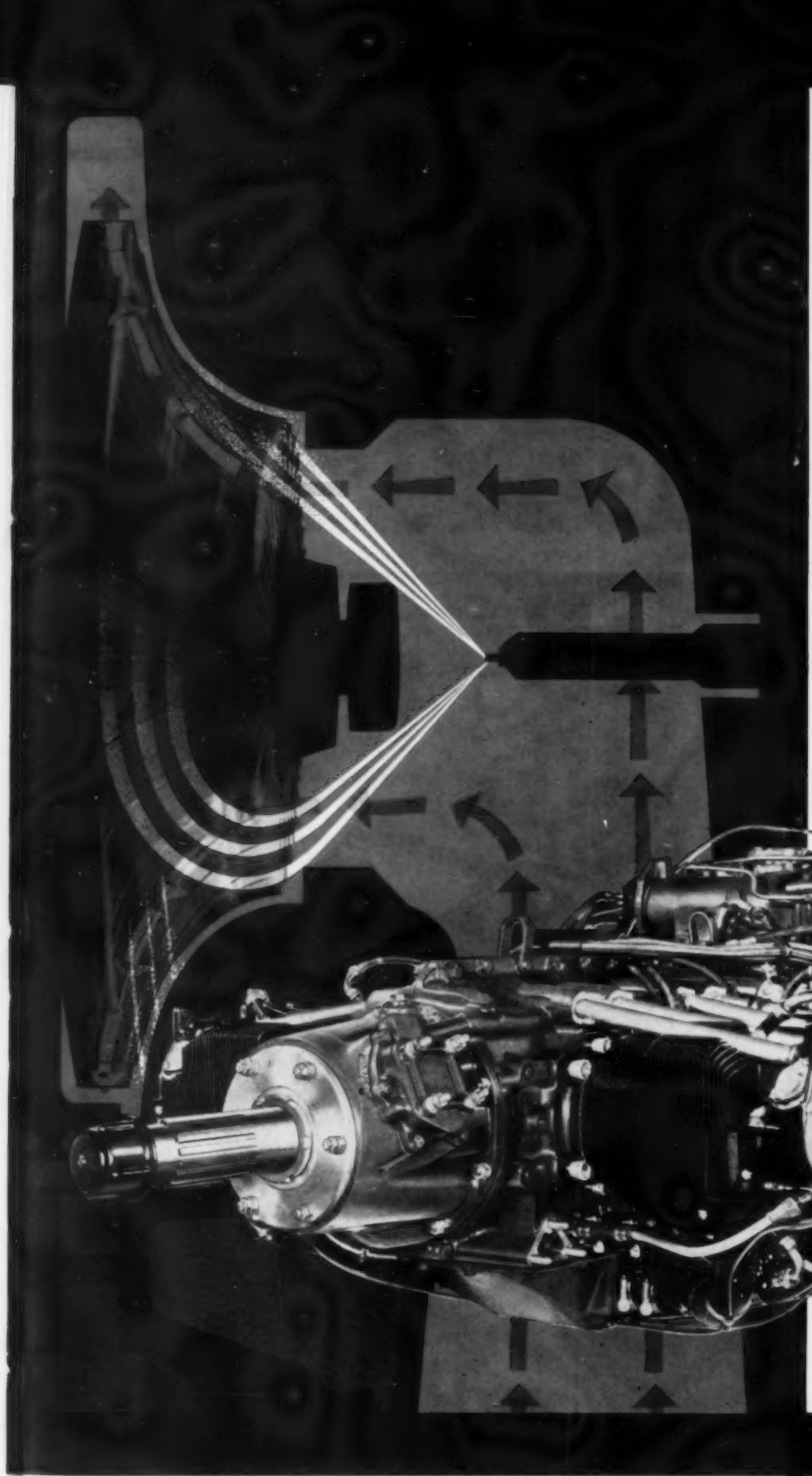
Turbulence, the report explains, lies in the wake of all aircraft and its severity and its persistence depend upon several factors. The dangers of wake or vortex turbulence are still unknown to many pilots. Engineering studies clearly indicate that vortex turbulence can be great enough to cause structural failure of light aircraft; however, vortices of such destructive magnitude are generally associated with aircraft of the larger civil transport or military types.

Studies Confirm Dangers

Citing this, the CAB report goes extensively into the mechanics of aircraft-generated turbulence and its hazards to lightplanes, and the CAB analysis is accompanied by a safety message to pilots warning against such hazards. FLIGHT MAGAZINE urges lightplane pilots to study this CAB safety material thoroughly, and quotes the following verbatim from the CAB report for that purpose:

Reports by Douglas (Douglas Aircraft Company Report No. SM-18647, "Theoretical Analysis of Lightplane Landing and Take-off Accidents Due to Encountering Wake of Large Aircraft") and a National Advisory Committee for Aeronautics Technical Report (Note No. 3377, "Flight Measurements of the Velocity Distribution and Persistence of the Trailing Vortices of an Airplane") discount the effect of "prop wash," or the wake due to jet exhaust, at a distance of 1,000 ft. Both assert that severe turbulence is created predominantly by wingtip vortices. The NACA study states: "The velocity distributions show no indication of a disturbance other than that produced by trailing vortices." It can be seen, therefore, that the energy produced does not depend on the type of power plant.

A paper on this subject issued by Beech Aircraft Corporation ("A Preliminary Study of Effects of Jet Blast or Wake on Other Aircraft" and "Evaluation Report — Effect of Wingtip Vortices and Sonic Shock on Army Aircraft in Flight") points out that a light aircraft at 100 mph. penetrating the vortices of a large jet aircraft at 90 degrees and one mile behind, recorded an acceleration of plus 2.5 g's and minus 3.5 g's. Other aircraft at greater speeds have meas-



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That's the supercharged, 340 hp Lycoming IGSO-480-A1A6. Fuel injection in this *proven* Lycoming power plant offers these important advantages:

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Increased power at altitude with fuel injection. Critical altitude is raised approximately 3000 feet with no increase in engine size.

Flatter engine is possible with fuel injection. Over-all engine height can be reduced to give streamlined engine nacelle.

For further information on any of Lycoming's complete line of power plants, write to: Lycoming Division, Avco Corporation, Williamsport, Pa.

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PERFORMANCE PROVEN!

An outstanding service record in the Twin Beech Bonanza . . . since October, 1958.

ured structural loads as high as 9 g's in the wake of large jet aircraft. The Beech paper states:

"1. If a small plane, flying a cruising speed, observes a jet aircraft and executes an evasive maneuver which increases the load factor to approximately its design limit, then penetration of the wake area could produce load factors in excess of design values, with structural failure resulting.

"2. If two or more aircraft are flying in formation, or close proximity, the combined effect of the wake could produce structural failures in the small aircraft."

Vortex Turbulence Charted

The NACA experimented with aircraft with smoke generators at the wingtips. Using an F-51 as the vortex generator and an F-80 as the receiver, it was determined that the energy of the vortex does not lessen appreciably for 35 seconds. The highest velocity within the vortices occurred 33 seconds after their origin. Velocities then gradually decreased for 60 seconds, the longest interval measured, but the vortex still retained a relatively large amount of circulation. From this it can be seen that peak velocity can be approximately 1½ miles behind an aircraft cruising at 180 mph. Also, that a relatively large amount of velocity will persist for 3 miles astern.

When a large jet aircraft climbs at approximately 420 mph., the peak turbulence is 3½ miles in back and a relatively high degree of turbulence will exist for 7 miles. In relatively still air, the turbulence can persist for several minutes or long after the aircraft is out of sight. The study indicates that vortices can persist, theoretically, for as long as 30 minutes. The energy of the vortices depends on the ratio of aircraft weight to the wing span and the speed, being directly proportionally to the former and inversely proportional to the letter.

A recent paper on this subject, published Jan. 1, 1957, by Beech Aircraft Corp., is "Evaluation Report — Effect of Wingtip Vortices and Sonic Shock on Army Aircraft in Flight." Beech participated in tests at Eglin Air Force Base, Florida. The report is based on observations, comments of military personnel and oscillograph test data. Its conclusion carries the following:

"Negative load factors higher than the minimum ultimate design requirements for Normal Category personal aircraft can reasonably be expected."

In summary, all tests and theory to date indicate that structural failure can be anticipated in light aircraft upon penetration of the vortices behind larger civil transports and military aircraft.

The variations and reversals of forces encountered when traversing a pair of vortices is of great scientific interest. The forces are both large and sudden.

When an airplane runs squarely through a pair of vortices at their diameters, the loads imposed are up, down, down and up, in that order. The total distance from entering one vortex to leaving its mate is short and would be traversed by a 120-mph. airplane in less than 2 seconds. The initial abrupt and powerful up-current might normally be met by down-elevator. Then, within a fraction of a second, a sharp reversal of load occurs, then again in the same brief interval, another reversal.

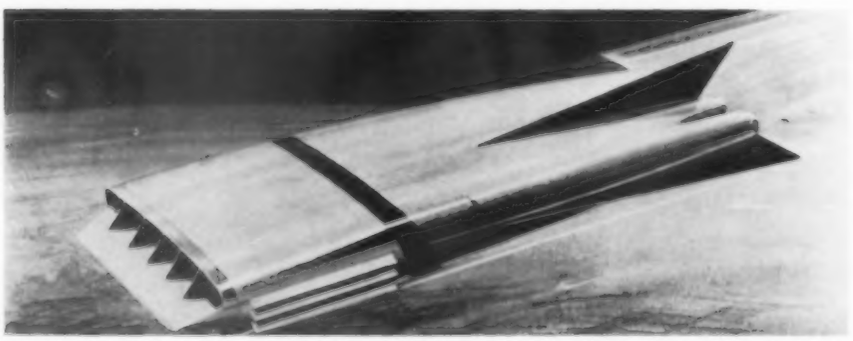
Pilot reaction during this short period can only be surmised. But if the elevator control were moved forward upon hitting the first up-draft, as it might be, the following forces would be greatly intensified. This secondary shock, under these conditions, can be enough to destroy civil aircraft which are designed to accepted standards for Normal Category aircraft.

The Piper PA-22 is certificated under Part 3 of the CAR. It is designed to an ultimate maneuvering load factor of 5.7 g's and in conformance with Part 3 has a negative ultimate maneuvering load factor of 2.28 g's. This model aircraft has not been tested to destruction and the actual negative load limits of all components have not been determined.

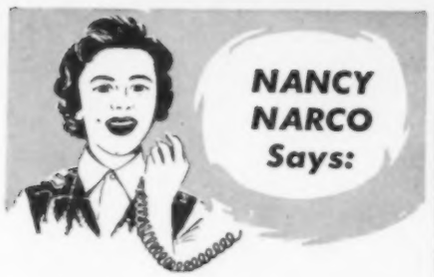
Authoritative computations show that the loads that could be encountered in the wake of a large aircraft such as the C-124 are of a magnitude just approaching the limit maneuvering load factors, positive and negative, and under certain conditions, may reach or exceed the negative ultimate maneuvering load factors of Normal Category aircraft. These certain limitations include any appreciable attempt by a pilot to hold constant altitude upon encountering the vortex.

TURBULENT ABOUT TO BE ENGULFED IN TURBULENCE — This little low-wing "Turbulent" British sport plane appears as a minnow hunted down by fish-looking Hawker Hunter jet fighters of the Royal Air Force. Tiny Turbulent was flown in this year's British National Air Races by Squadron Leader John de M. Severne, the jet Hunters being from the RAF's No. 111 Black Arrow Squadron.

—(British Information Services Photo.)



AIRLINER OF THE FORESEEABLE FUTURE — Hall L. Hibbard, senior vice president of Lockheed Aircraft, believes this wingless transport will offer "clearly attractive payloads for practical and economic operation in the foreseeable future." The 4,700-mph. airliner would carry passengers in a central cabin, offering 98-min. flight time between New York and Amsterdam. Deflected airflow would permit vertical takeoffs and landings. Hibbard discussed this and other designs recently in delivering the third annual Dr. Albert Plesman Memorial Lecture honoring the founder of KLM Royal Dutch Airlines. —(Lockheed Sketch.)



I got my ears pinned back when I mentioned several months ago that a lot of pilots use Omni "half-heartedly." Couple of people wrote in that they didn't find their Omni receivers dependable enough to rely completely on them.

I am sure most people would agree that these are isolated cases, but it does bring up the matter of what performance to expect from electronic equipment and how you can be sure of continuing good, reliable performance.

First it will help to understand the "habits" of electronic equipment. Despite the most careful manufacturing and installation procedures, a small percentage of any production run of aircraft radio will probably need servicing or adjustment after installation. Most of these service problems show up in the first 25 to 50 hours of use and might involve a new tube and minor re-adjustment or "peaking up." After that it's usually clear sailing. The Narco people have taken two major steps to assure the high degree of satisfactory performance enjoyed by Narco users.

To prevent "shake-down" problems, they subject components and finished units to severe testing. Critical tubes are "burned in" for 48 hours so that many tube failures occur in the factory instead of in the airplane. They put each completed unit on a vibration table which shakes the living daylights out of it while, at the same time, inspectors test performance and accuracy of the equipment.

Second, they've "extended the factory" to over *200* warranty service agencies where radios, during the warranty period, are given free service. A Narco purchaser can go to any of these warranty service agencies, whether on a trip or at home, and have his equipment checked and serviced "on the house" during the warranty period.

For continuing good performance of your equipment, it is well to give your radio a "home". Pick a good, reliable aircraft radio service organization and let them keep a watchful eye on your equipment. Like your family doctor, their continuing knowledge of your equipment's past maladies and symptoms will enable them to handle your servicing more efficiently and economically.

In the meantime, be alert for symptoms of deteriorating performance. Diminishing transmitter power, increased hash in the receiver, decreasing Omni accuracy are indications that a tube is getting weak or some other component should be replaced.

Regards,

Nancy

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190-CHANNEL CRYSTAL-CONTROLLED
VOR/ILS LOCALIZER INDICATOR
VHF COMMUNICATIONS RECEIVER

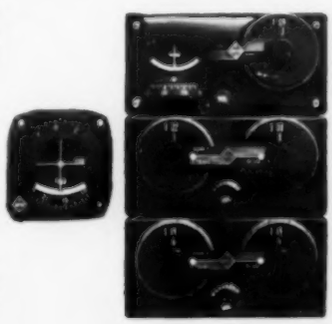
NEW *narco* MARK VI

Here's the answer to the need for an independent VOR/ILS localizer receiver/indicator—the Narco Mark VI. Gives you the convenience of fast, positive crystal-controlled tuning to all NAV/COMM frequencies between 108 and 126.9 megacycles. Lets you add a second Omni with minimum space and cost, without tying up your communications radio.

Weighs just 6½ pounds and requires only 3" by 6¼" panel space; completely self-contained, no separate power supply needed. Same size as the popular Narco Mark V, same fine crystal-tuning feature, exceptional accuracy, completely dependable for IFR operations.

MAKES POSSIBLE THE "ULTIMATE IFR SYSTEM" FOR LIGHT TWINS AND SINGLE-ENGINE AIRPLANES AT PRACTICAL COST

The Mark VI with two Narco Mark V's—one with Omni attached—gives you a complete "2½ System" for complete navigation and communications service.



- **Mark VI** for primary navigation always available for VOR or ILS.
- **Mark V** with VOR/ILS attachment—provides second Omni plus all-channel crystal-controlled communications.
- **Mark V** for primary all-channel communications always available for direct Center, Approach Control or Tower communications.

OR BUILD UP YOUR SYSTEM

Replace your older, limited-channel, tunable-receiver NAV/COMM equipment with a Mark VI for VOR/ILS navigation and a Mark V for all-channel communications. Add other equipment later.

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See your Narco distributor or write for new Mark VI brochure

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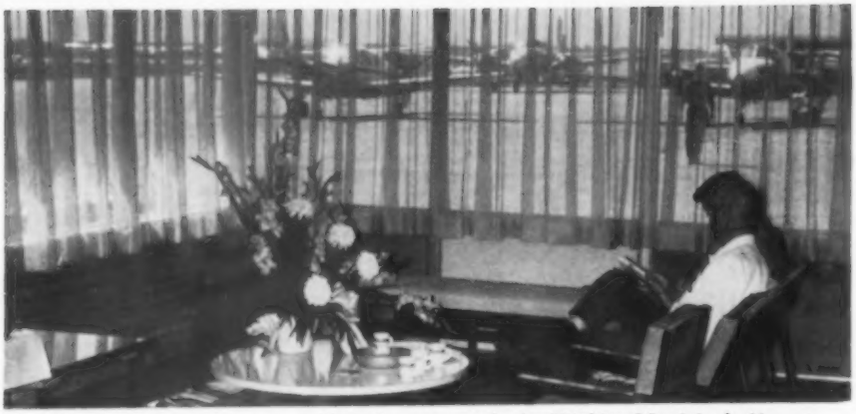


United Airplane Sales' new flight lounge overlooks Wichita Municipal Airport.

New Flight Lounge for United Airplane Sales

RALPH FLOYD, president of United Airplane Sales, Beech distributor at Wichita Municipal Airport, had Western Star Gene Autry, who flies a Beech 18, do the honors when United's new flight lounge was opened recently. The plush private terminal provides planning charts, telephones, weather teletypes and comforts for pilots and passengers.

New lounge was opened by Western Star Gene and Mrs. Autry and Wichita Mayor Justus Fugate (center, below). Looking on are Beech Sales Manager Leddy Greever, Commissioner Vernon Reed and Ralph Floyd (right), United's president.

FACILITIES IMPLEMENTATION

(Continued from page 35)

traffic control and weather reporting space.

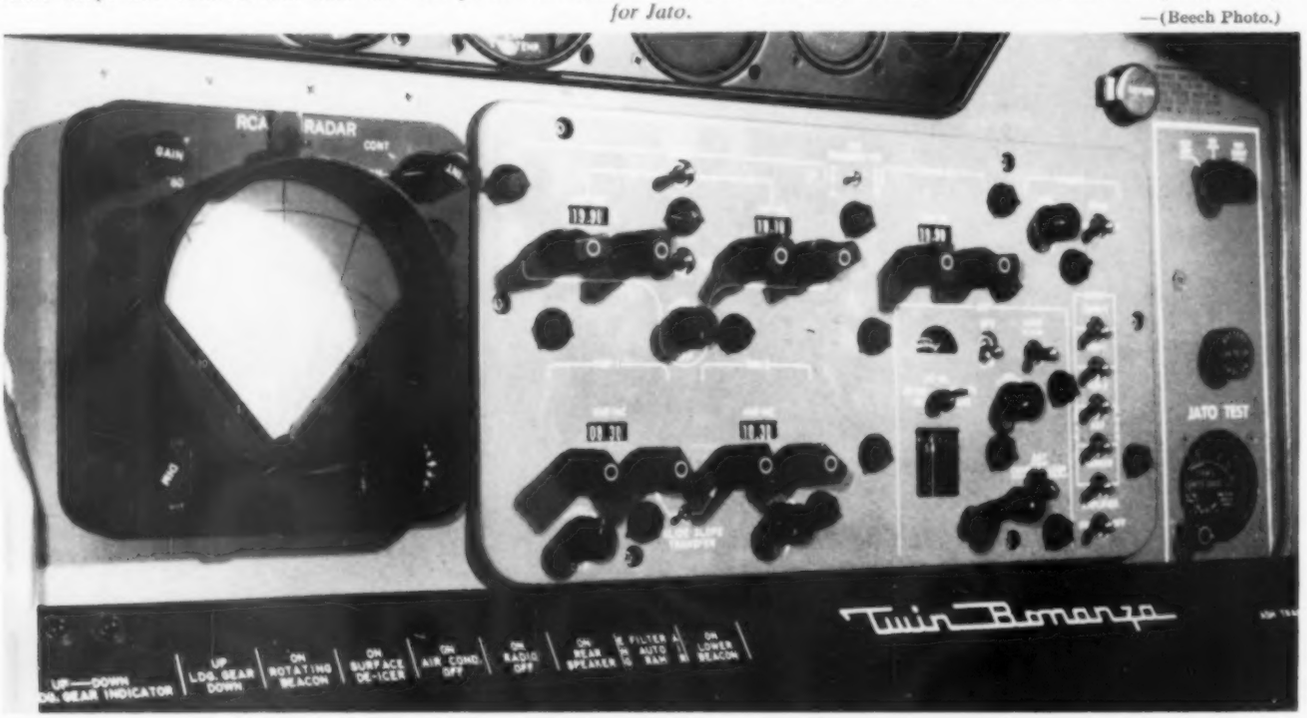
The record of the 86th Congress in enacting the extension of the Federal Airport Act is quite clear in emphasizing the responsibility of the Federal Aviation Agency for the use of Federal funds. The Agency is keenly aware of its responsibility and has made it clear that items relating to safety in the operation of aircraft will have first priority in the use of funds.

In addition to grants of Federal funds, the Federal Aviation Agency assists local agencies and individuals in the planning for and construction of adequate airports by developing technical standards and guides. Our Annual National Airport Plan is an excellent planning tool. We will continue to make every bit of technical information we can develop available to all, both the public and private agencies or individuals. The grant-in-aid program will be used to provide most urgent airport improvements needed in the national system for the benefit of our entire country.

Airport progress can best come from a fully cooperative effort at all levels of Government and all of the individuals in the industry. Real and effective cooperation will be needed if we are to successfully provide airport facilities for the future. I want to assure you of the Federal Aviation Agency's intention to do its part in that cooperative effort.

In addition to the fine work of the

NEW TWIN-BONANZA RADIO-ELECTRONICS PANEL INSTALLATION available from Beech factory has RCA weather radar scope and controls and dual nav-com panel with ADF and pre-set switching arrangement. Note small test panel at right for Jato. —(Beech Photo.)



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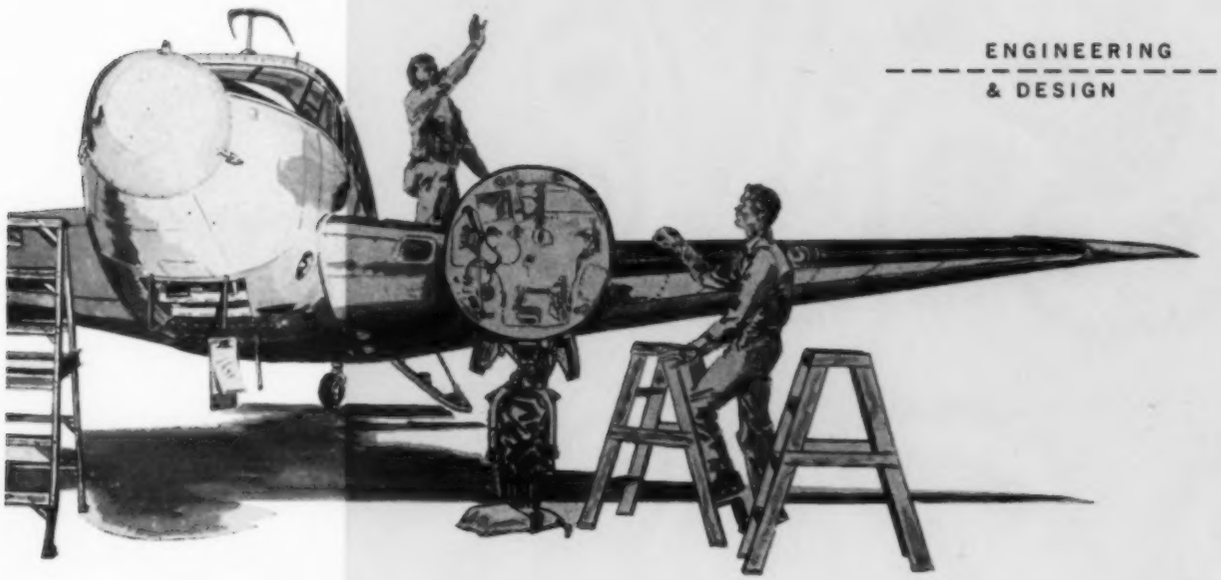

■ When you place your confidence in Spartan's Engine Overhaul Department you get the benefit of experience gained in overhauling over 17,000 engines since 1928 plus modern shop facilities to service all makes and types of aircraft engines. The next time you need overhaul service, place your confidence where thousands of other aircraft owners have — in Spartan!

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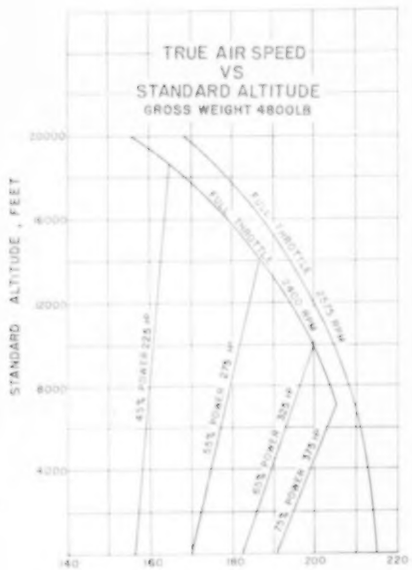
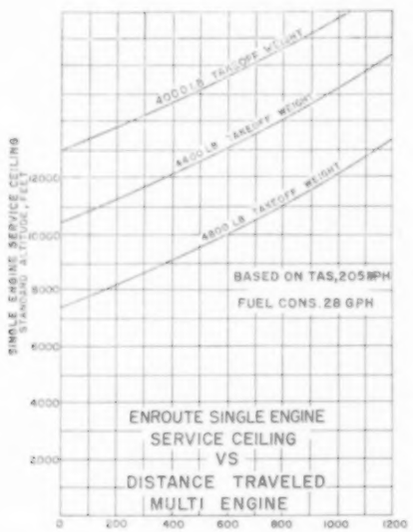
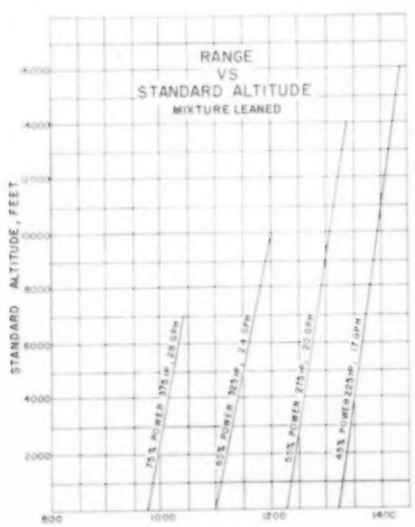
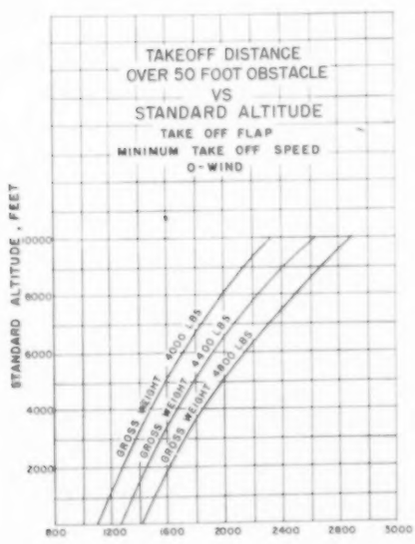
FACTORY-MANUAL PERFORMANCE CURVES FOR NEW PIPER AZTEC give the new 500-hp. twin a 200-mph. cruise at 10,000 ft. on 65% hp., a single-engine 4,800-lb.-gross-weight service ceiling of over 7,500 ft. which increases to over 10,000 ft. after 600 miles have been traveled, a 1,200-mile range on 65% hp. at 10,000 ft., and take-off distance over a 50-ft. obstacle, the latter being 1,400 ft. at sea level and 2,000 ft. at an elevation of 5,000 ft. Detailed performance is specified in the curves below. The 5-place Aztec is pictured above with its right engine feathered.

(Piper Photo by Anthony Linck.)







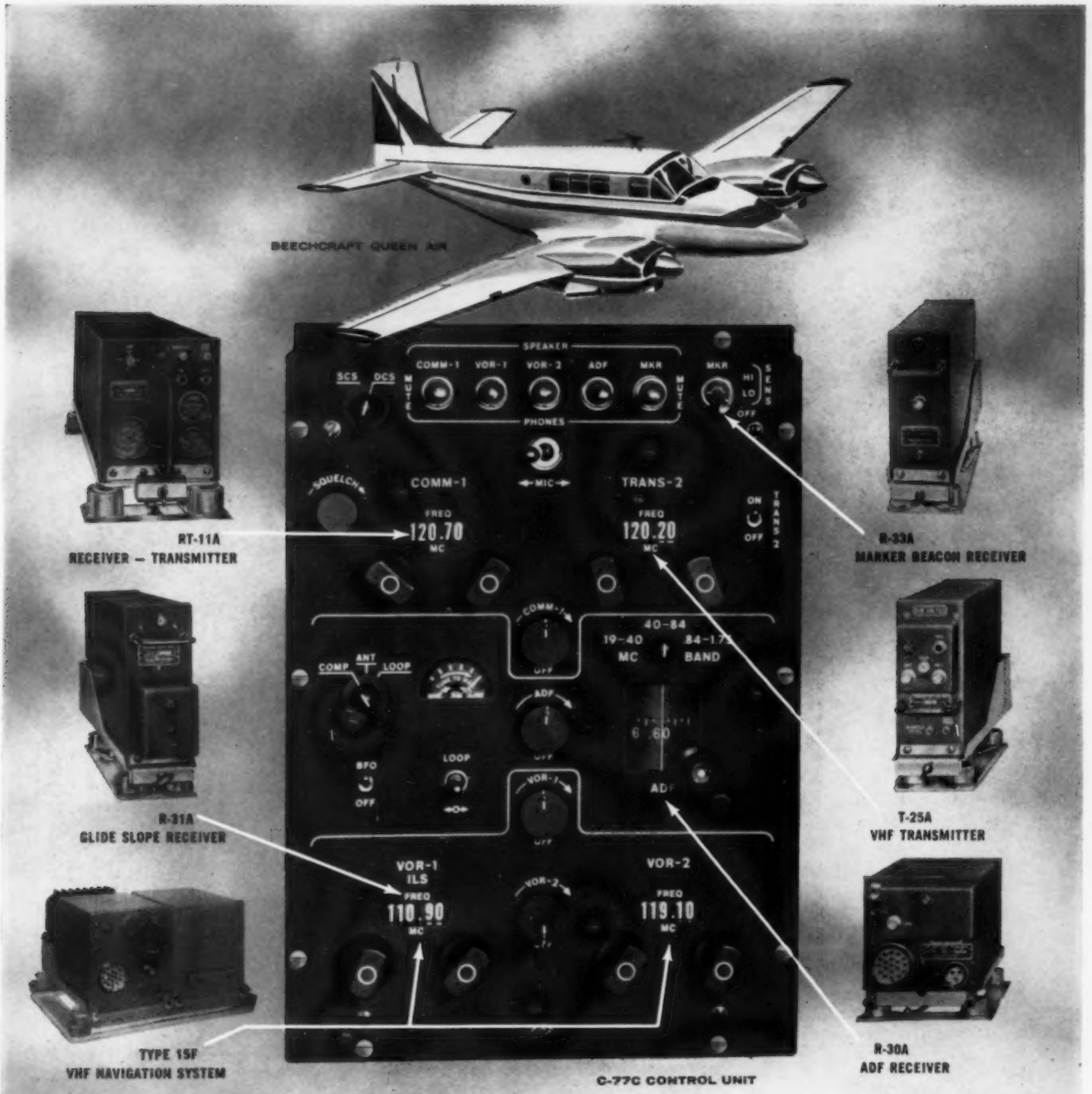


FAAP program in stimulating the construction of airports needed for the national aviation facilities system, the Federal government provides in the terminal area navigational and air traffic control facilities required for takeoff, departure, approach and landing. In meeting this responsibility we now have 217 control towers in operation, with funds already approved to provide 49 more through this fiscal year. We have 173 instrument landing systems now in operation, with the prospect of an additional 57 based on funds already approved. By the end of the next fiscal year we hope to have sequenced flashing lights provided at all of these airports where we have approach light systems installed.

In many major terminal areas, we are providing airport surveillance radars to assist in approach and departure control. We already have 48 installed and hope to increase this to 82 by the end of next year. At certain of our busiest airports we are also providing radars for other specific purposes, such as the precision approach radars for assisting the landing of aircraft under adverse conditions, and airport service detection equipment radars which are used for facilitating the movement of aircraft on the ground after landing and before takeoff. The Bureau of Research and Development is also developing a new system for ground control of aircraft which will employ railway-type signal equipment.

The communication and weather services make up a very extensive facilities network. Although unseen by the operator, they are the vital cement which holds the entire facilities system together, and provides the wealth of information required for the proper conduct of aircraft operations. We are

(Continued on page 64)



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In keeping with our confidence and faith in the growth and future of general aviation, BROWN AERO CORP has expanded its facilities to offer Aero Commander and light-twin owners a completely integrated service and maintenance base comprising every requirement for ONE STOP SERVICE. Whether you are in need of a new or used airplane, engines, radio, electronic equipment, parts or accessories — you will find our trained specialists ready to give you immediate service, complete in every detail.

Your best bet for service satisfaction in the **soaring sixties** is BROWN AERO CORP!

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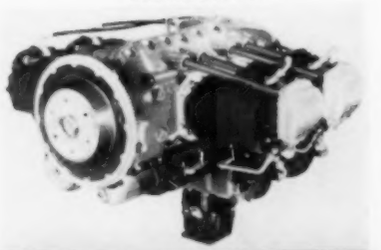
— DISTRIBUTORS —



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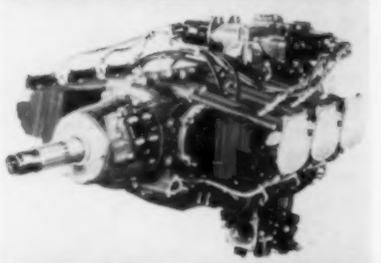

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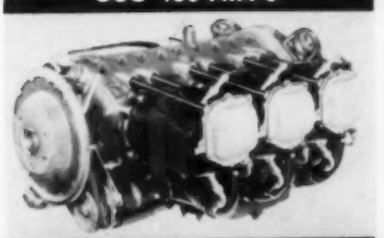

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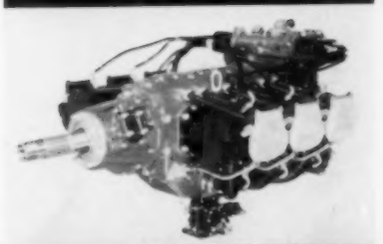


GO-480-DIA

bers of our experienced staff

Radio and Electronics — BOB SAXON
Mr. Saxon offers you the benefit of 24 years of versatile experience in aircraft radio and electronics. His knowledge of aircraft radio design and function is unsurpassed and he pioneered many innovations in this field.

Customer Service — ED MOORE
Mr. Moore is well known in pilot circles with 15 years experience in executive flying. He is well qualified to provide the necessary liaison between our various departments and the customer.

- **Hydraulic Maintenance**
- **Engine Service & Maintenance**
- **Radio & Electronic Sales and Service**

WILLIAM C. WHITE
Vice-President

RO CORP

DISON TEXAS Telephone (Dallas, Texas): AD 9-2618

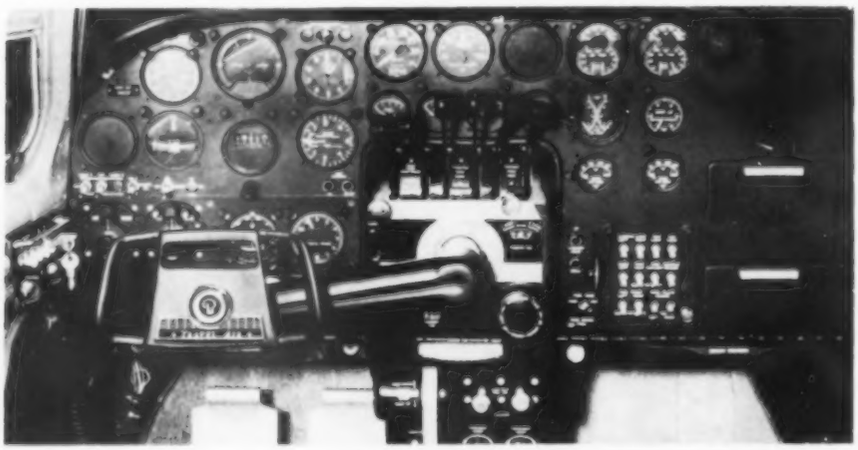
FACILITIES IMPLEMENTATION

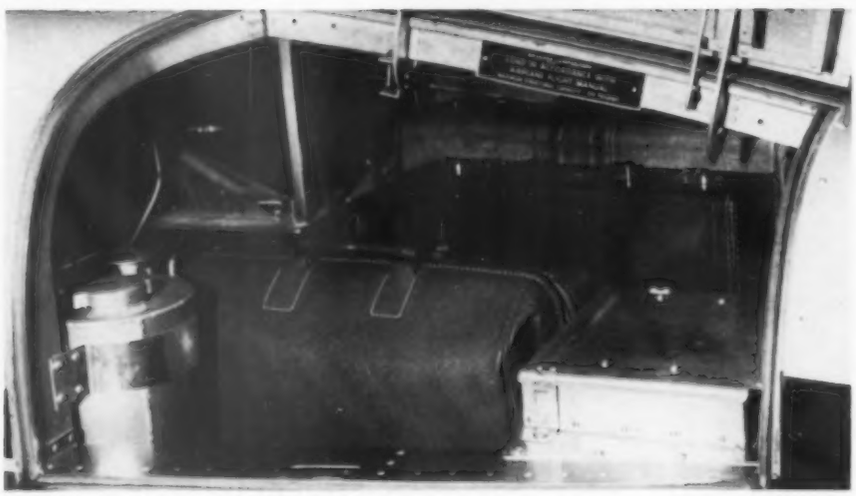
(Continued from page 60)

now completing our new communication facilities which provide direct pilot to center communications by means of stations located around the periphery of the air traffic control areas. This will make possible quicker and better communications between the pilot and the air traffic controller. We have also installed a network of high speed teletype to facilitate the exchange of air traffic control information between our important air traffic centers to meet the requirement for increased air traffic. We have installed 659 air-ground radio channels for direct center controller/pilot communications in addition to the several hundred air/ground circuits between control towers and aircraft. We have a new development in the communications area which will further improve our ability to contact the pilot from the ground and vice versa, even when traffic is at its heaviest. We are planning to do this by a data link system called AGACS (Automatic Ground Air Communications System) which is now being developed and tested by the Bureau of Research and Development.

Constant progress is occurring in the Weather field where the transmission and collection of weather data is being expanded and improved by installation of more sophisticated equipment. We also instituted a new system for determining landing minimums. We call this new procedure Runway Visual Range. It is based on determining by electronic means the actual length of runway lights which the pilot should be able to see on touchdown. We already have installed this system at five locations and will have 24 major airports using this procedure by the end of this fiscal year. We are working closely with the Weather Bureau and Air Force in developing new weather and communications equipment which will improve even further our ability to provide reliable information to the pilots, both in airline and general aviation.

We realize that we still have serious growing pains in developing our facilities system. However, we are confident that we are at least making progress in relation to the over-all growth of aviation. With continued support of the various segments of aviation industry, with the excellent understanding of our problems as shown by Congress, we will continue on our way to solve the many problems which still remain.





NEW FEATURES OF 1960 BEECH TRAVEL AIR include 5-seat interior, with track-mounted reclinable seats, and with front seats raised for better visibility. New instrument panel is pictured below, with ignition switches on left-wall panel and radio panel on left side of instrument panel. Travel Air has nose compartment (bottom photo) for radio, battery and baggage.

—(Beech Photos.)

NEW OFFICIAL SEAL of the Federal Aviation Agency depicts a light green globe on which is superimposed a gold 4-pointed compass rose.

Around the World Proof of RELIABILITY!

Frank D. Hansen, President of United Air Activities and Morris Flying Service, Inc. in Morris, Illinois, relies on AC Spark Plugs for all his flying.

It takes a lot of faith in your flying equipment to circle the world in a light plane. Frank D. Hansen and his co-pilot, Dan Sorkan, did it in 40 days, with complete confidence in the performance of their Piper Apache . . . sparked by AC SR-83P Aircraft Spark Plugs.

Starting from Chicago, they flew "Freedomland" through almost every type of weather: from the frigid blasts of Greenland to thunderstorms over Europe; from the blazing heat of Beirut to the monsoons of Calcutta. That's why they insisted on AC Spark Plugs.

Their confidence in AC Aircraft Spark Plugs was well founded. Says Hansen: "We used ACs exclusively, and every mile added to AC's reputation for reliability."

Try ACs in your plane. You'll soon discover that AC Aircraft Spark Plugs MUST BE THE BEST!

Aircraft Care starts with

AC

AIRCRAFT SPARK PLUGS

AC SPARK PLUG ⚛ THE ELECTRONICS DIVISION OF GENERAL MOTORS

AC presents the Art Carney Show, NBC-TV, January 8

DISTRIBUTED BY: **Airwork Corporation • American Avitron, Inc. General Aircraft Supply Corporation • Mid-Continent Airmotive Corporation • Pacific Airmotive Corporation • Southwest Airmotive Company • Standard Aero Engine Ltd. • Van Dusen Aircraft Supplies, Inc.**

HERE'S THE SIGN OF THE FINEST SERVICE FOR YOUR PIPER AIRPLANE

Piper has established a world-wide network of Factory-Certified Service Centers to assure you of the finest service possible for your Piper airplane. To earn the coveted designation, service organizations must meet rigid requirements, must be properly equipped and staffed by personnel who have attended the intensive service school conducted at the Piper plant. Dozens of Piper Factory-Certified Service Centers have been established throughout the nation and around the world, and more are being designated to assure convenient and competent Piper service wherever you may wish to fly.

FOR THE BEST IN PIPER SERVICE AND MAINTENANCE VISIT THE PIPER FACTORY-CERTIFIED SERVICE CENTERS LISTED BELOW

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BRidge 5-5741
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AVIATION SPECIALTIES COMPANY
Gallup Municipal Airport
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UNion 3-3621 *UNion* 3-5394
Gallup, New Mexico

BROWNING AERIAL SERVICE
Municipal Airport
P. O. Box 1173
HOmstead 5-1728
Austin, Texas

CUMMINGS & GROVES AVIATION, INC.
Houston International Airport, Hangar No. 8
MIssion 4-5593 *and OLive* 4-4351
Houston, Texas

DELAWARE AVIATION CORPORATION
North Philadelphia Airport
HObart 4-1600, *TWX PH* 520
Philadelphia 36, Pennsylvania

DES MOINES FLYING SERVICE, INC.
Howard Gregory, President
Municipal Airport
ATlantic 8-2218
Des Moines, Iowa

EXECUTIVE AIRMOTIVE, INCORPORATED
Stewart Air Park
P. O. Box 70
GArfield 8-3581, *GArfield* 2-7277
Parkersburg, West Virginia

J & J AIRCRAFT, INC.
Sarasota-Bradenton Airport
821 *General Arnold Road*
ELgin 5-6868
Sarasota, Florida

KEN-MAR AIRPARK, INC.
Ken-Mar Airpark
Box 2667, *University Station*
MUrray 3-6589
Wichita, Kansas

PIEDMONT AVIATION, INC.
Smith Reynolds Airport
PArk 5-0511
Winston-Salem, North Carolina

RED AIRCRAFT SERVICE, INC.
Broward County International Airport, Building 78
JAckson 3-9624
Fort Lauderdale, Florida

ROSS AVIATION, INC.
Riverside Airport
HIckory 6-6654
Tulsa, Oklahoma

ST. LOUIS FLYING SERVICE
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HERE'S THE FIRST ALL-NEW AG PLANE AT PRACTICAL COST

Totally Designed For Safe, Profitable Operation

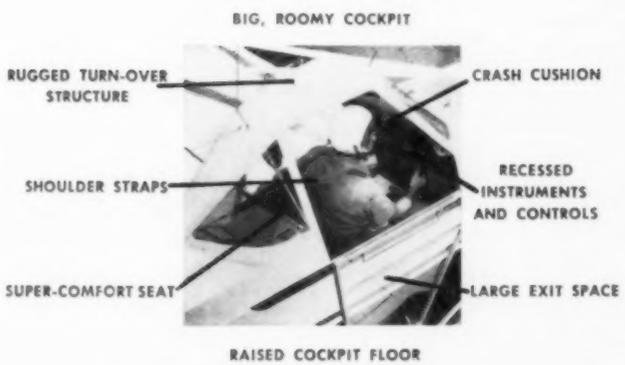
PIPER **Pawnee**

MODEL PA-25

HERE, at last, is an agricultural airplane designed from scratch to meet the requirements of the vast majority of aerial applicators. Here, at last, is an Ag plane embodying a long list of design features deemed desirable from years of government, industry and university research. It's the Piper Pawnee, practically priced, economy-designed, safety-engineered to give the aerial applicator a *safe, efficient, profitable* airplane.

Designed under the direction of Fred E. Weick, Director of the Piper Development Center, the Pawnee best meets the all-around requirements of the custom applicator. Don't make a move until you see, fly, dust or spray with the Pawnee. This hard-working airplane is the one for YOU!

DESIGNED WITH THE PILOT IN MIND!



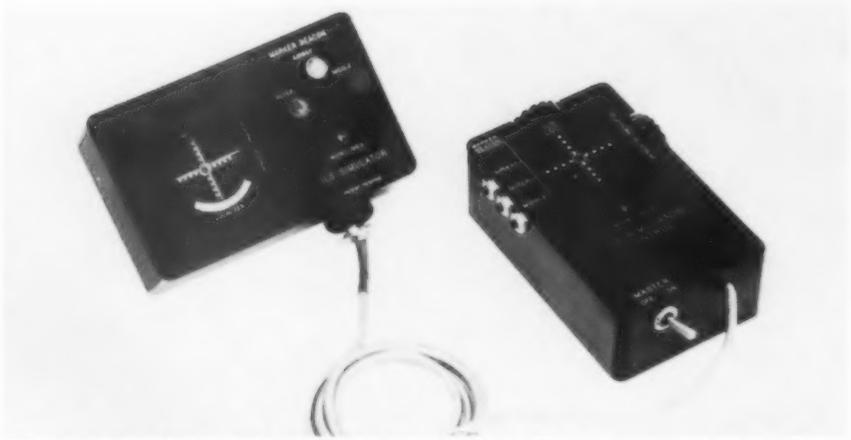
Plus these other important safety features: Rearward Cockpit Location • Unobstructed Vision • Outward Bending Longerons • Simple, Direct Fuel System • Wire Cutters • Overhead Deflection Cable.

A FEW OF THE MANY PAWNEE FEATURES

1100-pound useful load; 2300-pound gross; big 20-cubic foot, easily removable fiber glass hopper; quick, simple conversion for dust or spray; large quick-opening inspection panels; rugged 150 hp Lycoming engine with hinged motor mount; tough Piper Duraclad covering . . . just a few of the design features to assure dependable operation, economical maintenance, backed by world-wide Piper service and readily available parts. *See your Piper dealer or write for brochure, Dept. 1-FF.*

PIPER AIRCRAFT CORPORATION · Lock Haven, Pennsylvania

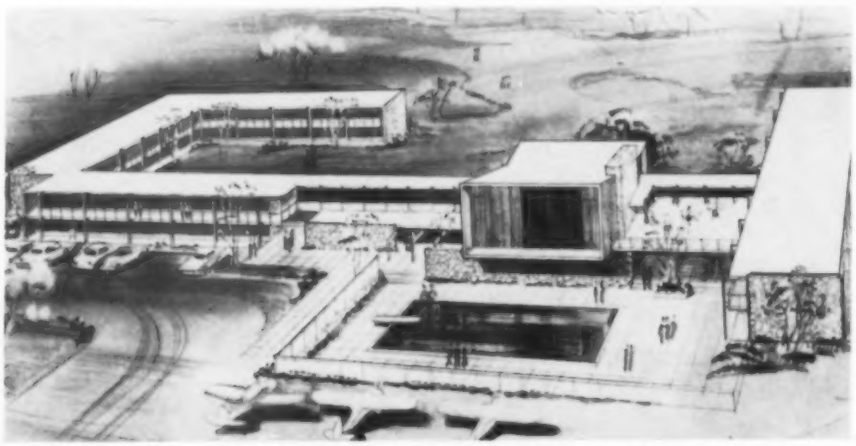
WORLD'S LEADING BUILDER OF AGRICULTURAL AIRPLANES



SIMULATOR FOR ILS FAMILIARIZATION AND TRAINING has an instrument indicator and a controller with which a pilot-instructor can display cross-pointer and marker indications to his trainee. Produced by Iconix, Inc., Palo Alto, Calif., it is compact and is readily transferred from one lightplane to another. Unit is priced at $137.50 including control unit, student display indicator and cabling.

NEW SUNAIR T-5-D crystal-controlled high-frequency transceiver is panel-mounted, has 5 transmit and 5 receive frequencies and built-in transistorized power supply, weighs only 9 lbs. and has edge-lighted face plate. It is priced at $895. A T-5-R version is available for remote installation.

—(SunAir Electronics Photo.)



NEWEST FLY-IN DELUXE MOTEL IN NORTHWEST is Bel-Air Inn, adjacent to Bellevue Airport across Lake Washington from Seattle. In addition to tie-down facilities and plush motel accommodations, it offers swimming pool and 9-hole putting course.

GULFSTREAM FLEET

(Continued from page 51)

The Gulfstream is powered by two 2,190-hp. Rolls Royce Dart RDa 7/2 turbines driving Rotol propellers. This power gives the Grumman a guaranteed cruising speed of 357 mph. at 25,000 ft. at its 33,600-lb. gross wt.

With an empty weight of 18,500 lbs., useful load is 15,100 lbs., without equipment and interior. Fuel capacity is 1,550 gals., weighing 10,440 lbs., with fuel consumption of about 700 lbs. per hour per engine for 357-mph. cruise at 25,000 ft., at which range is about 2,300 miles.

Three firms have ordered their second Gulfstream — Texaco, National Distillers and U. S. Steel.

DEMONSTRATIONS WITH THE NEW BEECHCRAFT QUEEN AIR are being conducted throughout the United States as leading Beech distributors conduct open house presentations of the new Beech line for 1960. Six-to-seven-place Queen Air is powered by two 340-hp. fuel-injected and supercharged Lycoming engines, cruises 200 mph. on 65% hp. at 10,000 ft., and has 230-gal. fuel capacity for range up to 1,445 miles.

—(Beech Photo.)

again for '60 Mooney sets the pace

. . . luxurious comfort . . . unmatched economy . . . ease-of-flying! Never has an airplane dollar bought so much speed, safety and comfort as in the 1960 Mooney. Continuing its leadership in the high-performance *and* economy concept of aircraft, Mooney's Mark 20A for '60 offers new advancements and greater opportunities for both business and pleasure use.

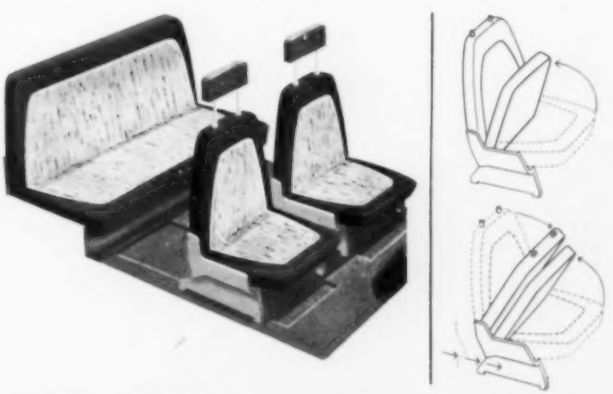
Teamed with Mooney's *unmatched economy* is the luxurious comfort of quality-tailored interiors *and* all-new seat styles.

No airplane is easier-to-fly than the Mooney. Both beginners and experienced fliers call the Mark 20A "a pilot's dream airplane."

The Mooney *standard of excellence* for 1960 includes:

- Speeds up to 190 m.p.h. and dependable 180 h.p. Lycoming engine.
- Easy-maintenance retractable landing gear with new down-lock system, including position lights.
- Noise-free cabin with added soundproofing, thicker windows and new no-maintenance exhaust system.
- Airline-type ventilation system.
- Retractable footstep for easy entrance and exit.
- Wide tri-cycle landing gear for accurate control on the ground.
- New and improved braking system.
- Lowest full-coverage insurance rate.
- Fully shock-mounted instrument panel, designed for easy, accurate reading and utility.
- New and original life-time maintenance warranty.

See and fly the 1960 Mooney at your dealer's . . . enjoy the feeling of quality and a sense of craftsmanship which are "safe-flight" engineered in every detail.

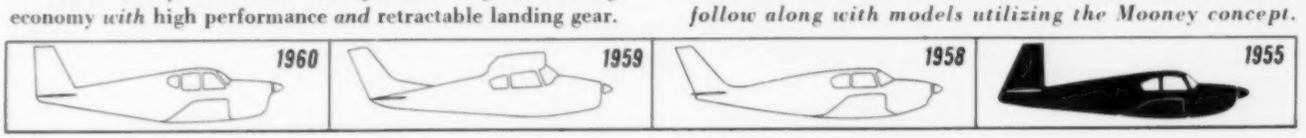


Plush new interior featuring rich new fabrics and completely redesigned seats provide a new era of elegance for the Mooney. Personalized comfort is assured in soft, contoured seats, individually controlled with reclining seatback and adjustable headrests.

MOONEY AIRCRAFT, INC. **Kerrville, Texas**

Since 1955 Mooney has manufactured its jet-age style of executive aircraft with clean aerodynamic design combining economy *with* high performance *and* retractable landing gear.

Its proven success by public acceptance and millions of flight miles has caused three other leading aircraft manufacturers to follow along with models utilizing the Mooney concept.



GROWTH OF ALASKA AIRLINES, INC.

	Year Ending 6/30/58	Year Ending 6/30/59	Percent Change
Revenue Passengers Boarded			
Scheduled Flights Only	42,362	54,015	up 27%
Scheduled and Charter	70,366	93,735	up 33%
Revenue Passenger Miles (000)			
Scheduled Flights Only	20,263	32,151	up 58%
Scheduled and Charter	29,092	60,519	up 108%
Mail Ton Miles	598,938	762,051	up 27%
Revenue Plane Miles			
Scheduled Flights Only	2,185,746	2,246,800	up 2%
Scheduled and Charter	2,798,271	3,130,623	up 11%

ALASKA AIR SERVICE

(Continued from page 37)

and from remote prospector and trapper sites. However, some two-thirds of the all-important, revenue-producing passenger miles were accounted for by the 14,000 passengers traveling between Seattle/Portland and Fairbanks/Anchorage in States-Alaska operations.

Freight and Mail by Air

Air freight is a big item in the revenue column of Alaska Airlines' reports, producing one-sixth the dollar volume produced by passengers. Air freight in Alaska bears little resemblance to air freight in the 'lower' 48. Major items of Alaskan air freight are such things as household goods (usually of military personnel transferring to Alaskan bases), perishable foodstuffs that are everyday items on grocery counters (at prices that reflect their airborne transport cost), magazines for newsstand sale, even automobiles. On a recent flight of Alaska Airlines' Golden Nugget from Seattle to Fairbanks, a check of the forward compartment revealed a caged white toy poodle and a caged alley-type tomcat, a dozen or so assorted cartons of household goods, including a vacuum cleaner and a washing machine, several crates each of lettuce, tomatoes, oranges, too-many-to-count brick-sized packages from a Chicago electronics manufacturer to Ladd Air Force Base at Fairbanks — all in all, the flight carried over 11,000 lbs. of freight and a capacity load of passengers with every seat occupied. We were told that more freight was waiting, and would normally be carried on flights having below-maximum passenger loads. Movable bulkheads in Alaska's beautifully appointed DC-6C's allow variation in space to accommodate widely varying combinations of passengers and cargo.

Air mail is an important item on States-Alaska flights, but a very minor load on flights within Alaska. The reason is simple: practically all mail in Alaska must travel by air; there is no other transport. Hence, on intra-Alaska flights, it is not at all unusual to see (as on a recent flight from Anchorage to Nome) garbage cans, baby buggy, several sacks of potatoes, and numerous packages bearing Sears & Roebuck labels. This is parcel post as carried by air in Alaska under regular zone parcel post rates. Because of the bulk and weight and quantity of this mail and of air freight, stops at McGrath or Kotzebue or other points of 1,000 population or less are scheduled for 30 to 45 minutes to allow time for unloading cargo.

Within Alaska, airline operations are much less formal than in the 'little' 48 (Alaskans keep forgetting that there are now 49 other states). Aside from modern and impressive terminals at Fairbanks and Anchorage terminal buildings at such points as Nome, Kotzebue, Unalakleet, etc. may be quonset huts, a hangar leanto, a shack, — or none at all. When ready for departure, no P. A. system assembles the passengers. Instead, the captain leans out his cockpit window, waves his arm, and calls "Looks like we're ready, climb aboard." Many points receive scheduled service without an airport — sandbars and rivers serve as air strips.

In States-Alaska service, most of the passenger traffic is moving to or from the West Coast states. In all, about 33% are to or from California, 30% to or from the Seattle and Portland areas and the states of Oregon and Washington, and the remaining 37% are from the rest of the world, but mostly from within the triangle formed by New York, Washington and Detroit, according to H. W. (Hank) Bierds, assistant to President Charles Willis of Alaska Airlines.

In total, States-Alaska traffic is at a level of some 250,000 passengers a year carried by four airlines: Alaska, Pacific Northern, Pan American and Northwest. This traffic has been growing at a rate of about 10% per year. Efforts at promoting Alaskan air tours are really in their infancy, but the airlines are looking forward to the

Rugged ice-capped peaks (left) provide spectacular scenery for airline passengers. Alaska Airlines DC-6C combines passengers and cargo in its cabin, photo below showing forward cargo door being loaded with freight and household goods. Rear passenger compartment retains luxury of first-class DC-6.

—(Alaska Airlines Photos.)

READY TO FLY THE MODERN WAY WITH AN AUTOPILOT?

Pick TACTAIR

BEST PERFORMING, MOST COMPLETELY SATISFACTORY AUTOMATIC FLIGHT SYSTEM FOR BUSINESS AIRPLANES

TACTAIR T-3 FAA-APPROVED FOR THESE AIRPLANES

Beech Bonanza
Beech Debonair
Beech Travel Air
Cessna 175/Skylark
Cessna 180/182/Skylane
Cessna 210
Cessna 310
Piper Apache
Other approvals pending

Weighs only 8 pounds.

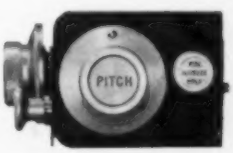
An automatic flight system in your airplane can be the most satisfactory investment you can make to increase the safety and utility of your plane, relieve you almost completely of flying chores, let you arrive refreshed and relaxed. But when you make such an investment you want to be sure you have the best. You can wisely select the Tactair T-3, three-directional automatic pilot, because *it is the best.*

Only Tactair gives you smooth, pneumatic operation, with no load or dependence on your electrical system. This superior feature means no clutching of the controls, no possible damage to the unit. Tactair is the only three-directional automatic flight system with Course Selector and Heading Lock *as standard.* And Tactair provides a nation-wide network of factory-approved service agencies, manned by factory-trained technicians.

The Tactair T-3 has been thoroughly proved and improved to provide you with the best, the most dependable, the most completely satisfactory automatic flight system for your business airplane. Once you've flown with the T-3, you'll agree that automatic flight is as important as radio in any well-equipped airplane.

ONLY THE TACTAIR T-3 GIVES YOU COURSE SELECTOR AND HEADING LOCK AS STANDARD

Just dial your course, before take-off if you wish, in the upper card of your Tactair Directional Gyro, engage the Heading Lock and your Tactair turns you automatically to the course you've set, holds that course unerringly. Want to change course? Just set the new course you want on the upper DG card . . . Tactair does the rest.



AND OPTIONAL ALTITUDE HOLD!

Here's the ultimate in automatic flight! Automatic Altitude Hold, offered as an optional feature on the Tactair T-3. At any altitude you wish to cruise, switch on Altitude Hold. It will maintain that level precisely. Easily added to any T-3 installation.

See your nearest Tactair distributor for a demonstration, or write for Tactair T-3 brochure, Dept. F-1.

TACTAIR® INCORPORATED
DIV. OF AIRCRAFT PRODUCTS CO.

BRIDGEPORT, PENNSYLVANIA
(SUBURBAN PHILADELPHIA)

FOR 19 YEARS SPECIALISTS IN PRECISION AIRCRAFT PNEUMATIC AND HYDRAULIC CONTROLS

tourists as the fastest growing element of passenger traffic growth. And with what Alaska has to show the tourist, the airlines are sure to be right.

During the fiscal year ending June 30, 1959, Alaska Airlines reported gains of 33% in passenger boardings, 108% in passenger miles carried (indicating increasing long-haul traffic) with increases of only 11% in airplane miles flown.

There are many operational difficulties now and there'll be more in the future. Today, in Fairbanks, Alaska Airlines has ⅔ of ½ of a hangar for use in maintaining its equipment ranging from Cessna 180's to DC-6C's — and the temperature during much of the year averages about zero with lows of 40 degrees below zero not infrequent. The reason for the hangar shortage — building costs in Alaska are sky-high. Alaska Airlines has two major maintenance bases — one in Anchorage for its small planes (Cessna 180, Noorduyn Norseman, Piper Apache, Beech 18) and one in Everett, Washington, for its larger equipment (DC-6C, DC-4 and C-46) and for specialized outside maintenance for selected customers. That's quite a variety of equipment, and just in itself presents quite a maintenance and operational problem.

While Alaskan flight operations are only infrequently bothered by towering cumulo-nimbus thunderhead build-ups, extreme low pressure areas create special problems, frequently bringing crosswinds up to 70 knots. Instrument conditions are also frequent, keeping crews sharp busting 200-ft. minimums in areas surrounded by some of the ruggedest scenery on the North American continent.

Alaska's economy presently rests on a rather tenuous footing, heavily supported as it is by military spending for major air bases only an hour's flight from Russian soil, for DEW Line stations (Distant Early Warning), and for Army support bases. Not that anyone seriously believes that the cold war may warm up enough to do away with these bases and Dew Line, but technological progress in rocketry and space satellites poses the possibility of outgrowing the needs for continuation of such bases on a large scale.

Alaska presently does not have the economic base to weather loss of military spending without serious repercussions. Gold, the traditional source of Alaskan wealth, no longer pays the cost of taking it from the ground. The once enormous fishing industry has dropped drastically in production.

Growth Patterns

Alaska is still a storehouse of wealth — both mineral and timber. Statehood has been the key that has begun to open the doors to this wealth. With statehood comes a willingness on the part of capital to invest in exploring for and developing this wealth. Statehood means stepped-up migration into Alaska. Statehood means a better security for private investments. Already Safeway and Woolworth and other such chains representing hotels, foods, drugs, etc. are opening units in Alaskan towns. And oil — especially oil — has all Alaska buzzing with news and rumors. It's no rumor that helicopter charters are hard to get, for they're booked up solid by oil operators, and the same goes for float planes and other charter operators. Statehood means publicity to increase the flow of tourists. According to Alaska Airlines' Executive Vice President Richard W. (Dick) Gilbert and Vice President-Sales LeRoy Peterson, the above are among the best reasons for optimism about Alaska's future, and, therefore, for optimism about the future of Alaska's airlines.

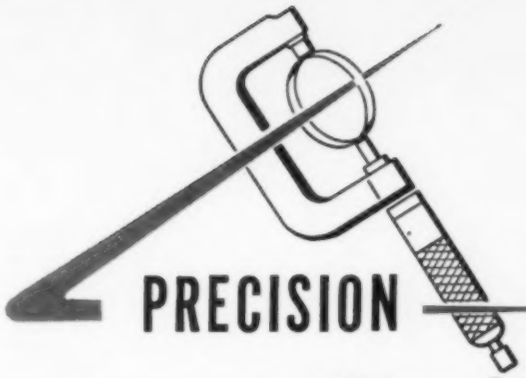
Although in complete accord on the big future that Alaska faces, airline people are not necessarily in accord on the ways in which that future is developing.

Hank Bierds, in his economic and planning duties as long-time assistant to the president of Alaska Airlines, believes that there is beginning an "internal migration" that will see population dwindling in many of the very small settlements as the shift goes to increased population around the more favorably located communities. Bierds expresses this as a shift from a "God-given economy" to a "man-made economy." In other words, a shift from dependence on living-off-the-land to a production-and-service type of economy. Bierds believes that for the airlines this will result in a diminishing amount of bush operations and a more than offsetting volume increase of intra-Alaska operation.

On the other hand, Noel Wien, a man who has been creating air services in Alaska since he flew the first airplane into Nome in 1924 and who today is vice president of Wien Alaska Airlines, is not in complete accord. During a discussion with Noel Wien and his wife, Ada, in the quiet of their pleasant Fairbanks living room one evening, we learned of his belief that the majority of both Alaskan cities and villages will grow and will demand increasing air services as the population of the new state expands with immigration and natural growth.

It seems possible that both theories can be right. Some villages not favorably located may find population dwindling as the call of the dollar is heard from larger centers, and other villages may well boom almost overnight as they are reached by new high-

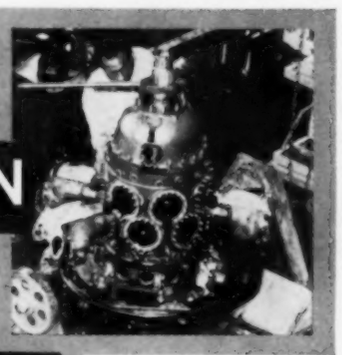
CARIBOU FROM THE NORTH COUNTRY were the center of attraction recently in ceremonies at St. Louis. On occasion of first deliveries by de Havilland Aircraft of Canada of new twin-engine, high-wing STOL U. S. Army YAC-1DH workhorse aircraft, two live young caribou, the gift of the Province of Newfoundland, were presented to the St. Louis Zoo. Sandy A. F. MacDonald, de Havilland public relations executive, is pictured at left below making the presentation.

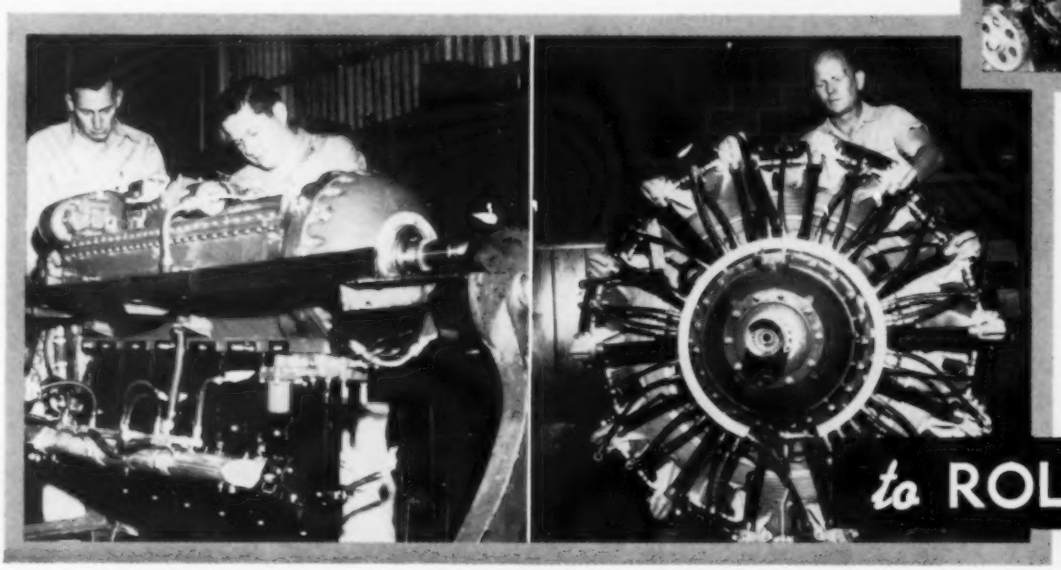


PRECISION ENGINE OVERHAULS by DAS

through **Quality Control**

from **TEAR DOWN**





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DALLAS AERO SERVICE overhauled engines are providing power for airlines, business and private aircraft owners in all parts of the world as DAS precision overhauls have been time proven for trouble free, dependable service under the most rugged operational conditions.

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NEWEST ORGANIZATION FOR AIRMEN IS THE LAWYER-PILOTS ASSOCIATION, which held its organizational meeting recently at Monticello, N. Y. Headquarters address is P. O. Box 289, Camden, N. J. Aims include promotion of fellowship among legal eagles, cooperation with civil agencies in emergencies, to assist in drafting, interpretation and enforcement of aviation laws, and to promote improved flight proficiency and safety. Officers of non-profit group are pictured from left, bottom row, and include Charles W. Sydnor, Sandstone, Va., treasurer; L. H. Bloom, Central Region vice president; Albert Rathblott, Camden, president; Margaret L. Lebaire, Trenton, secretary; Frank J. Docktor, Northeast Region vice president; Edwin Marger, Southeast Region vice president; and Sommers T. Brown, Washington, D. C., director. Herbert H. Freise, Western Region vice president, is not shown.

ways or as oil discoveries, lumber camps or tourist attractions, etc. give them impetus.

Both of these men and their respective airlines believe emphatically in the new state's future as one of fast expanding economy and population. Wien Alaska Airlines put new prop-jet Fairchild F-27's in service this past summer. Alaska Airlines, with three years of DC-6C operation behind, is currently shopping for more modern long-haul equipment, with a decision due in the near future and operations to begin in 1960.

Our guess is that this dynamic airline with its powerful confidence in Alaska's future will go all the way and buy the best and most attractive jet liner available. They'll figure that with a big bear by the tail, it will take the biggest, fastest, finest equipment to help them hold on. Such a decision would be typical of Alaska Airlines and of Alaskans. The 49th state can be expected to do big things.

NEW CESSNA 310D

(Continued from page 28)

Heat radiation of the circulating oil and the closing of the valve results in improved efficiency in confining the oil temperature within operational limits during extreme weather conditions.

The 310D is powered by two fuel-injection Continental I0-470-D engines, each rated at 260 hp. at 2,625 rpm. Standard fuel capacity is 102 gals. with optional capacity of 133 gals., usable fuel being 100 and 130 gals. respectively. With optional capacity, all-out range is 1,070 miles in 4.9 hrs. at 218 mph. using 70% hp. at 8,000 ft. and, with economy power, all-out range is 1,440 miles in 8.4 hrs. at 171 mph. at 10,000 ft.

Built-in, foldaway arm rests have been added as standard equipment for new interiors. Cushioning comfort of seats and seatbacks has been increased by using a combination of new gauge springs and a blending of laminated materials. An additional ash tray has been added to the left rear cabin wall when an individual fifth seat is added.

Other 1960 changes include addition of a woven pile fabric encased in metal and attached about the perimeter of all landing gear doors for sealing. Aux-tank filler caps are redesigned for a flush fit with the wing skin, allowing visual inspection from the cabin. A quick-drain valve has been added to the aux-tanks for convenient draining water or sediment. A fuel strainer push-pull control has been mounted inside the inboard right nacelle and the outboard side of the left nacelle along the aft edge of the oil level inspection door.

TOP PIPER AIRCRAFT DISTRIBUTORS IN SALES FOR 1959 were honored at Piper's annual sales meeting recently. Alex Muller, second from right, represented Jonas Aircraft and Arms Co., export, which sold 211 Pipers, and John Baker, second from left, Long Beach, sold 207 Pipers, while Art Whitaker, third from left, Portland, sold 94 Pipers. Others in top hats, left to right, with number of 1959 sales, are Roy Neal, Lubbock, 91; Howard Gregory, Des Moines, 78; George Edgcumbe, Elgin, Ill., and Lester Longbrook, Mountain States, Denver, tied with 73; O. P. Hebert, Safair, Teterboro, 60; George Robatin, Ken-Mar, Wichita, 59; Tom Davis, Piedmont, Winston-Salem, 58; Frank Shelton, Anderson, Phoenix, and H. McRoberts, St. Louis Flying Service, tied with 57; Alex Muller of Jonas, and Glenn White, Trans Aircraft, Hamilton, Ont., 59. Without top hat at left is W. C. Smith, assistant sales manager of Piper. —(Piper Photo.)

AERO Commander Port of Call

for 24 Hour Red Carpet Line Service

Those who appreciate the luxury and speed of the AERO COMMANDER find the facilities of SOUTHWEST AIRCRAFT, Inc. in keeping with their discriminating requirements in air travel.

- **Overnight Hangar Storage**
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We would like to suggest that you, too, make SOUTHWEST AIRCRAFT, INC. your port of call. Our staff can assure you of superior service — the only product we sell. This is why so many Aero Commander owners over the nation have made Southwest Aircraft, Inc. their headquarters in the great Southwest. Here their aircraft is given expert attention by skilled service and maintenance specialists. So, whether you fly a single engine aircraft or a multi-engine executive transport, Southwest Aircraft is prepared to serve you around the clock, seven days a week.

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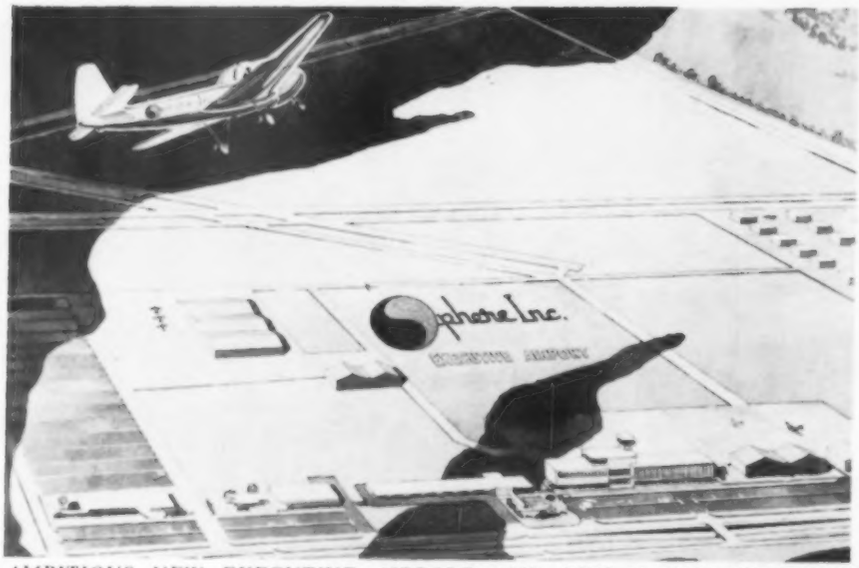
MOBIL Aviation Gasoline and Oils



AMBITIOUS NEW EXECUTIVE AIRPORT AND RESEARCH-DEVELOPMENT COMPLEX are included in a proposed $10,000,000 project on a 760-acre tract 8 miles south of Ft. Worth near a growing Dallas-Ft. Worth industrial area. A new firm, Sphere, Inc., plans completion of the first phase in July, 1960. Pictured is a drawing of the project, including 6,000-ft. main runway, T-hangars for 240 planes, a dozen larger hangars for rent to operators, an aircraft factory for manufacture of personal planes, a terminal-office building and a motor hotel. Tract fronts on U. S. Highway 81. Raymond H. Beyer (seated) is president of Sphere, Inc., and is shown with Stephen J. Holland, secretary. Applicatio ns are being accepted now for hangar and office leases.

FOR CONTRIBUTIONS TO SAFE FLYING THROUGH ESSO "WING TIPS" ADVERTISEMENTS, Esso Standard Oil Company last month received a Flight Safety Award from the Flight Safety Foundation. The firm's ads feature practical reminders for safer, easier and better flying. Left to right are V. G. Carrier, Esso industrial ad manager; Brig. Gen. H. R. Harris, Flight Safety Foundation executive committee; R. C. Womald, Esso aviation sales; Ansel Talbert, FSF vice president; R. C. Oertel, manager of Esso aviation sales, and R. Bennett, Esso ad supervisor.

PIPER AIRCRAFT'S 50,000th AIRPLANE was an Apache delivered recently, representing more civilian aircraft than have ever been produced by any other manufacturer in the world. It went to Firwood Manufacturing Co., Dearborn, Mich., for company flying. Left to right in the photo are W. Kilgore, Firwood sales manager; Jake W. Miller, Piper Aircraft sales manager; Merrill Ericson, Firwood president, and A. Finney, Finney Aviation Co., Plymouth, Mich., Piper dealer who made the sale.

—(Piper Photo.)

AIR REPORT

(Continued from page 5)

production of its near-Mach 2 all-weather F8U-2N Crusader jet fighter, which will make its first flight early in 1960.

NORMAN G. LARSON, Southern California distributor of Beech airplanes, has been reappointed chairman of the California State Aeronautics Committion. . . . **SHELBY M. KRITSER,** Beech distributor at Amarillo, was appointed to the Texas Aeronautics Commission last month.

REALIGNMENT OF FAA FIELD RESPONSIBILITIES, effective Jan. 1, 1960, places increased supervisory authority in Washington bureaus and program offices of the agency. The position of "regional administrator" is abolished and six new posts of "regional manager" will be established. "In the future I shall be able to hold a single official responsible for the execution of each of the Agency's problems," said Administrator E. R. Quesada, promising greater uniformity in application of nationwide policies and programs.

THE 1960 WORLD CONGRESS OF FLIGHT has been canceled, according to James H. Straubel, executive director of the Air Force Association, which sponsored the first World Congress of Flight last year at Las Vegas.

A NEW ANNUAL AVIATION COMPETITION will be conducted under the auspices of the National Aeronautic Association as a result of action taken last month at a meeting in New York. A second meeting was to be held early in January for further planning. The annual competition will include air racing, aero-

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GRAY AIRCRAFT SVC. CO., INC.
D. A. Cody, Service Manager
Love Field, Dallas, Texas

GREENSBORO-HIGH POINT AIR SERVICE, INC.
Greensboro-High Point Airport
Greensboro, North Carolina

ELLIOTT FLYING SERVICE
- Municipal Airport, Des Moines, Iowa
- Municipal Airport, Davenport, Iowa

THE NORMAN LARSON CO.
PLANESERVICE, INC. (Service Division)
Van Nuys Airport, Van Nuys, Calif.
(Los Angeles Area)

ROSCOE TURNER AERONAUTICAL CORP.
Municipal Airport, Indianapolis, Ind

TEXAS AVIATION CORPORATION
G. K. Roberts, Pounds Field
Tyler, Texas

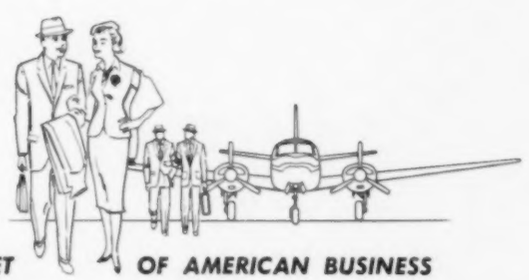
TOPEKA AIRCRAFT SALES & SERVICE
Municipal Airport, Topeka, Kansas

TRADEWIND AIRPORT CORP.
Tradewind Airport, Amarillo, Texas

TULSAIR DISTRIBUTORS, INC.
Hangar 8, Municipal Airport, Tulsa, Oklahoma

UNITED AIRPLANE SALES, INC.
New Municipal Airport
Wichita, Kansas

Beechcraft



BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

Denver Firm's Unique Hangar for Its F-27

Different from any in America is a new hangar being built by Ideal Cement Co. at Denver's Stapleton Airfield for its private Fairchild F-27 executive propjet. Pictured above, it features a diamond-shaped thin-shell lightweight concrete barrel roof with all weight supported by only two heavy concrete abutments at the ends. The 3-in. roof slab provides a 160-ft. span and extends 108 ft. from front to rear, with roof clearance of 33 ft. at front and 24 ft. at rear. Floor will be heated. Ideal Cement's president, Chris Dobbins, and his new F-27 are shown below. The F-27 covered over 100,000 miles during its first five months of operation.

—(Photos by David Mathias, Denver Post.)

batics, military formation flying, static displays, soaring, parachute jumping, model aircraft and antique and experimental aircraft. The NAA committee is headed by Jacques Istel of the Parachute Club of America, with Russell Nichols of the Academy of Model Aeronautics as vice chairman. Martin Fleer of NAA is chairman of the site committee.

MARCH OF DIMES AIRLIFTS will be operated at airports all through the U. S. during January to hop passengers at $2 for adults and $1 for children, all proceeds going to the March of Dimes. Pilot-owners, gas and oil dealers, airport operators and others donate their services, with FAA granting permission for private pilots to carry paying passengers whose fares go to the March of Dimes. Airlifts are planned locally. Details and assistance are available from The National Foundation, 800 Second Ave., New York 17, N. Y.

KAMAN H43-B TURBOCOPTER set new world's altitude record of 30,100 ft. last month for helicopters of its class. It was piloted by Capt. Walter Hodgson and Maj. William Davis of the Air Force. . . . **LYCOMING T53-L-1 TURBINE** in record-breaking Kaman H43-B incorporates vaporizing fuel injection system which allows stable engine operation at twice the engine's design altitude. Rated at 860 shp., this Lycoming is in volume production. Lycoming is now developing a higher rated 960-shp. version designated T53-L-5.

NEW ALOUETTE II, marketed by Republic Aviation, has new Turbomeca Artouste IIC turbine with overhaul life of 750 hrs. This is over twice the 350-hr. life of the 400-hp. Artouste IIB-1 which it replaces. The doubling of overhaul life was achieved by derating the new engine from 480 to 400 hp. for 70-degree cooler operating temperatures. New engine also uses 5% less fuel than its predecessor.

MAXIMILLIAN GARAVITO, editor and publisher of Revista Aerea Latinoamericana, New York, has been named president of the International Society of Aviation Writers. Garavito heads ISAW's 4th annual Conference scheduled for July in Mexico City.

NEW AERO COMMANDER DISTRIBUTOR for Massachusetts is H. A. (Sandy) Laughlin (right, above), president of North Atlantic Airways, Beverly, Mass. With Laughlin are Gene Charles (left), Aero Commander sales manager, and Bob Geis, Aero Commander domestic sales manager.

—(Aero Commander Photo.)

NEW FAA LIGHTPLANE INSPECTION REGULATION permits certificated mechanics holding inspection authorizations to inspect and certify the airworthiness of single-engine fixed-wing aircraft. Previously,

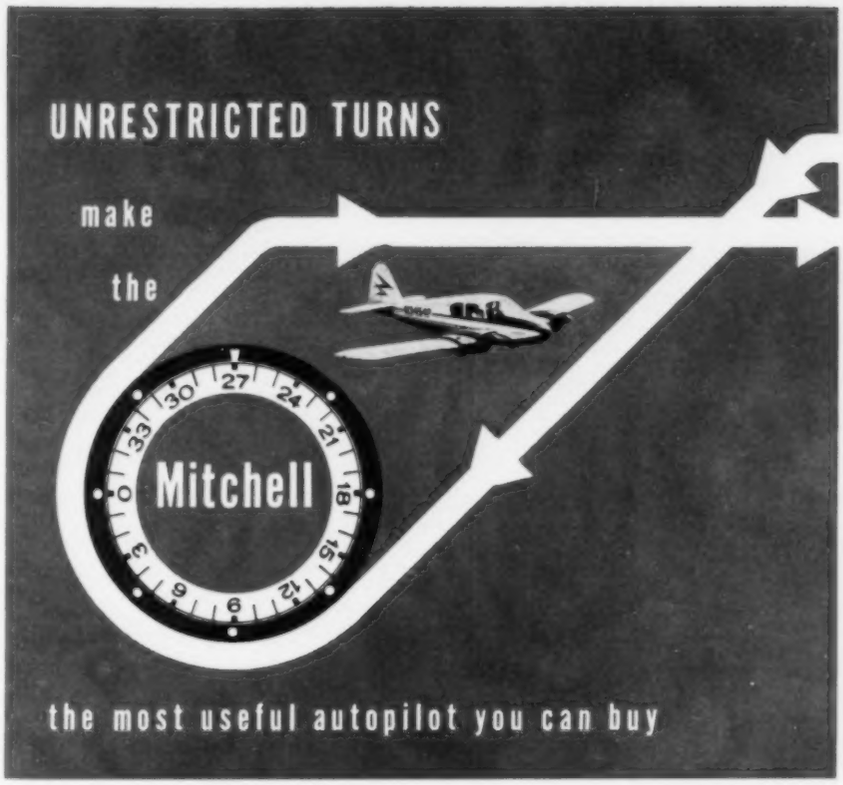
EVERYBODY'S INVITED to the Antique Airplane Association's First Annual Dinner-Dance on Feb. 27 at the Hotel Edison in New York City. Plugging the event in the picture is Miss Antique Airplane Association herself, Dorothy Stretch, daughter of J. Stretch of Airtex Products, Morrisville, Pa. She's shown with a 1927 Challenger.

inspection was permitted only by a manufacturer, certificated repair station or certified air carrier. Another section of the new regulation, Amendment 1-3, Part 1, CAR, provides more flexibility for plane owners whose aircraft are temporarily certificated in the experimental category. The previous regulation required that a plane first certificated in normal category, then temporarily transferred to experimental category, had to be inspected again before being elegible for a standard airworthiness certificate. The new regulation eliminates the need for inspection, upon restoration to standard configuration, but the plane must still be presented to FAA for an airworthiness certificate.

AGE 60 IS MANDATORY RETIREMENT POINT FOR AIRLINE PILOTS under a new FAA regulation. FAA said there are 40 airline pilots of age 60 now and 250 more will have reached 60 during next 8 years and explained that progressive deterioration of both physiological and psychological functions after age 60 would be a hazard in modern airline operations. . . . **FAA HAS STEPPED UP ROUND-THE-CLOCK INSPECTION** of all airline training programs and flight operations to improve airline and public safety. New regulations require FAA approval of each airline's training program, more comprehensive training for co-pilots and annual co-pilot proficiency checks by FAA or a designated check pilot.

AMERICAN EXPRESS CREDIT CARD CHARGING OF AIRCRAFT SERVICE is now available to pilots and aircraft owners at 177 fixed-base operations in 45 states and Canada. American Express Co., Box 37, Church St. Station, New York 8, N. Y., has a new 12-page directory listing operators who honor the cards.

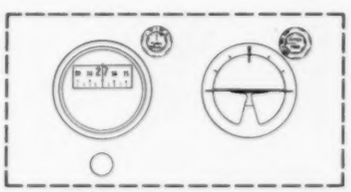
NEW AZIMUTH INDICATOR for navigation, the TIA-1, introduced by Tamar Electronics, Inc., Santa Monica,, Calif., is a high-precision autosyn receiver fitted with a double-ended pointer. Displaying both heading and reciprocal, the dial can be rotated 360 degrees in either direction without disturbing pointer. Neon light illuminates both dial and pointer from behind.



Fly precision holding patterns, procedure turns, IFR approaches . . hands-off . . . with the Mitchell all-transistorized automatic pilot. Unlike other lightweight autopilots, you never need to disengage or overpower the Mitchell to turn 180, 270, or 360 degrees. Simply turn the directional gyro the number of degrees you wish to turn and let your Mitchell do the flying. Whether you fly for business or pleasure . . . VFR or IFR . . . this superb eight-pound autopilot will introduce you to a new realm of precision flying. The Mitchell is simple and inexpensive to install, requires no warm-up, and uses less power than your instrument lights. FAA approved for almost all single-engine and light twin business aircraft.

Let your Mitchell dealer demonstrate this precision automatic pilot, used on more record-breaking endurance and distance flights than any other make. **$2425** for 12 volt system; **$2650** for 28 volt system. (Optional altitude and heading selectors extra).

For the pilot who wants the ultimate in an automatic pilot, Mitchell now offers two new optional features: **Automatic Heading Selector** that enables you to dial the exact heading you wish to fly; **Automatic Altitude Selector** allows you to dial your altitude.



New Mitchell 2-control model has all the features of the 3-Control model except pitch control, which can be added at any time. **$1095** (with Automatic Heading Selector, **$1480**).

(prices subject to change without notice)

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GASCO, INC.
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GENERAL AVIATION SUPPLY COMPANY
St. Louis, Missouri: Oklahoma City, Oklahoma
Dallas and Houston, Texas: Phoenix, Arizona

Manufactured by MITCHELL INDUSTRIES, INC., Mineral Wells, Texas

New Business in the Hangar

PACAERO ENGINEERING CORP., Santa Monica, installed Jato and gross weight modification, radar, alternate fuel source, heater system and interior work on Paul Holst's Michigan Tool Lodestar. . . . Jim Ketner brought in Texas Eastern Transmission's Learstar Mark I for interior work, paint job, engine change and inspection. . . . Two U. S. Steel Grumman Gulfstreams came in for interior and electronic installations. . . . H. F. Wood brought in the Gillette Gulfstream for interior and electronics. . . . Two General Motors 440 Convairs were flown in for Allison propjet Super Convair conversion. . . . Allison Division of General Motors sent in their 340 Convair for conversion to a Super Convair, as did AC Spark Plug. . . . In for miscellaneous work were Don Olin's American Gilsonite Lodestar and Jack McVicar's British American Oil Learstar Mark I. . . . Harry Conover brought in his Fluor Corp. Lodestar for Learstar modifications.

EXECUTIVE AIRCRAFT SERVICE, Redbird Airport, Dallas, delivered another Gulfstar conversion to Gulf Oil's Red Irwin. . . . Ken Hunter brought in Kerr-McGee Oil's DC-3 for new carpet and repairs. . . . Russ Purchase's Dow Chemical DC-3 was in for recovered elevator and repairs. . . . Ken Jolley's Texas Gas Transmission DC-3 received repairs.

SIMPLIFIED COCKPIT RADIO CONTROL by Bendix is an experiment in Air Force human engineering to integrate all of a high-performance aircraft's radio switching in single small panel without requiring visual attention. Touch operation of 12-key board is easily learned. Panel weighs 8 lbs., 5¾ ins. wide and controls six different radio functions.

—(Bendix Photo.)

AERO CORPORATION OF ATLANTA performed X-ray inspections for A. L. Sylvia's Tennessee Coal & Iron Lodestar. . . . Radio work was performed for Aubrey Keif's Texaco Beech 18. . . . M. H. Wood brought in Southern Air Transport's C-46 for No. 1 check. . . . A. L. Middleton's Milner Enterprises Super Ventura received electronic work. . . . Engine change and prop overhaul were performed for L. C. McGeehee's Miami Airlines C-54. . . . E. L. Beyer's Miami Airlines DC-3 received No. 1 check. . . . Weight and balance were performed for Bill Miller's Mississippi Power and Light Twin Beech.

PACIFIC AIRMOTIVE, Burbank, has been designated as overhaul agency for Westinghouse Air Brake's Decelostat and Maxaret anti-skid devices. . . . **MIDCONTINENT AIRMOTIVE,** Kansas City, Denver, Chicago and Tulsa, is midwestern distributor for Meletron aircraft pressure sensing devices.

NEW AIR ASSOCIATES CATALOG FOR 1960 contains 252 pages listing over 20,000 aircraft products for retail dealers and fixed-base operators. Copies are available at no charge in person or by letter on appropriate letterhead at Air Associates offices.

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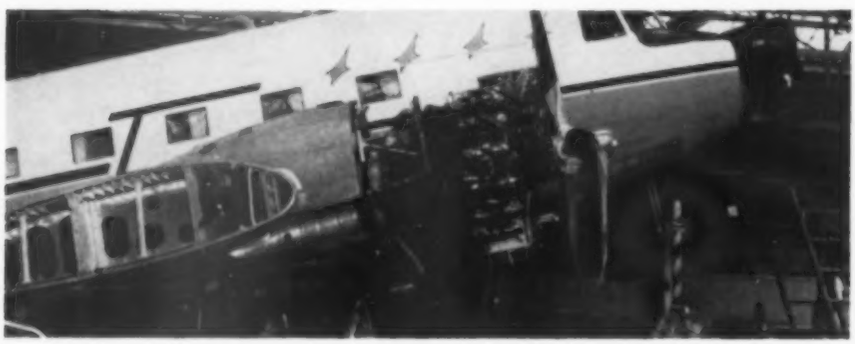
Whether you're flying single or multi-engine craft, one plane or a large fleet, you'll find the answer to all your problems of **keeping them flying** safely and with maximum economy, at Aero of Atlanta. Efficient, dependable, experienced service. Come and see us in Atlanta . . . or send us your aircraft now!



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COMPLETE FACILITIES FOR CONVERSION, MAINTENANCE, SERVICE, OVERHAUL OF AIRCRAFT, HELICOPTERS, ENGINES and PROPELLERS - FACTORY METHODS

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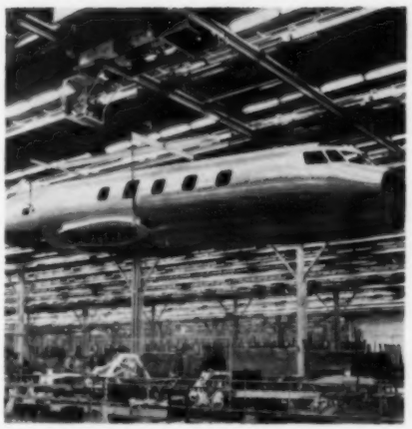
DALLAS AERO SERVICE, Love Field, Dallas, performed double engine change and annual on Paul Jones' Shell Oil de Havilland Dove from Los Angeles. . . . Walt Hedrick's Houston-based Shell Oil Dove was in for overhaul. . . . Jim Richardson brought in the Harsco Dove from Harrisburg, Pa., for engine change. . . . John Lofton's Western Company Dove was in for work. . . . Modification for work in Bolivia, South America, was performed on a de Havilland Beaver brought in by Bristow Helicopters of Somerset, England.

REMMERT-WERNER, Lambert Field, St. Louis, has delivered a new DC-3 conversion to Campbell Soup, Camden, N. J., Charles Nelms, chief pilot. It has 16-passenger custom cabin, RCA ACQ-10 radar, Sperry A12 autopilot with C4 Gyrosyn and H5 electric horizon, dual Collins 17L6-51R3 VHF communications, dual Collins 51R3 omnis with dual glideslopes and ILS, dual RMI's with dual Bendix Omnimags, dual ARC-21 ADF's, an HF transceiver, and custom panels for radio, instruments and electrical system. . . . John Trotter's National Brewing DC-3 was in for lightweight landing gear doors and dual ARC-21 ADF's. . . . Charles Schenk's Wyandotte Chemical DC-3 received exchange of control surfaces. . . . Double engine change, annual and landing gear overhaul were performed on



FIRST PRODUCTION JETSTAR FUSELAGE was recently lifted from jig at Lockheed's Georgia factory, where production is under way with first production airplane to fly in July. Meanwhile, four-engine prototype will fly early in 1960 with new Pratt & Whitney JT12 jets. Fuselage length is 60 ft. 4.5 ins., one of the largest ever assembled in a single jig.

—(Lockheed Photo.)

Ralph Piper's Monsanto Chemical "Prairie Wings" DC-3. . . . Fresh deicer boots went on the Falstaff Brewing DC-3 flown by Hank Haddock and Bud Willett. . . . R-W's Pompano Beach facility in Florida was busy with the following: Dick McNally's Freeport Sulphur DC-3 was converted to Super-92 engines. . . . Pete LaFrambois and John Corrier brought in the Wolfe Industries DC-3 for new interior, cabin heater and Sierracote heated windshield. . . . Huber Homes' DC-3 received lightweight landing gear doors. . . . O. E. Sparks took his Holley Carburetor DC-3 to Pompano for dual Sierracote windshields. . . . Max Pray's Beech twin, flown by Jean

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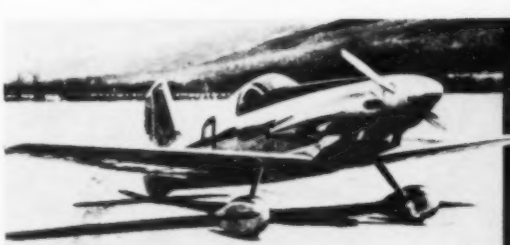

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Stroh, had a new custom interior installed.

L. B. SMITH AIRCRAFT CORP., Miami International Airport, performed inspection, radar and fuel flowmeter checks for two General Mills DC-3's brought in by H. Nystrom and B. Stone. . . . C. Stone's Outboard Marine DC-3 was in for 1,000-hr. inspection and servicing. . . . Also in for service were L. N. Bradley's C-18, C. L. Penton's Dunn Construction Aero Commander, Jack King's Langenfelder DC-3, Centex Construction's Beech 18 flown by Ernie Blagg, A. E. France's State of West Virginia Aero Commander, L. J. Snow's Nationwide Transport DC-3. . . . A. P. Fisher's Marcell Co. Aero Commander, a Sears, Roebuck DC-3 flown by M. E. Eide, and William O'Neal's Madden & Playford Lodestar.

HOWARD AERO SERVICE DIVISION, San Antonio, is nearing completion on Don Bond's second Celanese Howard 250 Lodestar. . . . . Another 250 Lodestar will be delivered in January to S. J. Groves & Sons, Ray Bukkila, pilot. . . . Lane Hartwell brought in an Essex Wire Lodestar for Howard power packs and nacelle heaters. . . . Two DC-3's are undergoing modernization and modification for Purdue Aeronautics, Paul Maisonneuve, maintenance superintendent. . . . Leonard A. Smith's Western Pipe Line Lodestar received new paint job and radar. . . . Henry Sykes brought in Bowman Cattle Company's Beech C45H for certification kit. . . . A. L. Potter's Hudson's Bay Oil and Gas Lodestar was in for fuel tank re-seal, radio repairs and interior changes. . . . J. W. Beasley and G. Dexter Martin brought in Southern Sash's Lodestar for the Howard 250 conversion.

50,000th LEAR ADF came off the production lines at Santa Monica last month. Beaming over the Lear ADF's unprecedented success, left to right, are Paul Momenteller, marketing director; Forelady Verna Horton and Assembler Alice Bekemeir; Division Manager K. M. Miller and Factory Manager Lorell Doubledee. The 50,000th unit was gold plated. —(Lear Photo.)

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. . . Tommy Neyland's E. E. Cockrell, Jr., Super Ventura was in for 1,000-hr. inspection. . . . Raoul Castro's International Harvester DC-3 was in for 8,000-hr. overhaul, repainting and right engine change.

AIRESEARCH AVIATION SERVICE, Los Angeles International Airport, has three more Grumman Gulfstreams in for custom installations, bringing to seven the number of Gulfstreams brought to AiResearch so far. General Electric, a major oil company and Food Machinery are each having custom executive interior installed. Additionally, GE is getting Bendix RDR-1D radar, Lear 102-B autopilot, complete radio and electrical installation and exterior painting. The oil company Grumman is getting RCA AVQ-10 radar, Collins autopilot and integrated flight system. Food Machinery is getting Bendix RDR-1D radar, Sperry SP-20 autopilot, Sperry engine analyzer, radio, electronics and exterior painting. Gene Beattie flew in GE's Grumman and Dick Mahoney was driving Food Machinery's propjet. . . . General Motors' third 440 Convair was received from Convair for custom interior, aux fuel tanks, painting and other items. . . . An oil company has a 340 Convair in for stainless steel overlay on the engine nacelles and various service bulletins.

PIEDMONT AVIATION, Winston-Salem, had Vic Swanson's Sears, Roebuck DC-3 in for new paint job. . . . Dale Balzer, Chatham Manufacturing Co., took delivery of a rebuilt DC-3 with new interior, radar and maximizer. . . . R. J. Reynolds Tobacco's new Fairchild F-27 was delivered to Herb Drew with new interior.

SPARTAN AIRCRAFT, Tulsa, installed new de-icer boots on Billy Parker's Phillips Petroleum Lodestar. . . . Dave Shultz brought in Ashland Oil's Lodestar for double engine change, radar installation, stabilizer modification, interior refurbishing and new paint. . . . A heated windshield was installed in D. A. Van Dyke's Samedan Oil Lockheed 12. . . . Clare Kingsbury's Warren Petroleum Learstar received fuel tank repairs. . . . Radar installation and double engine change were performed on Johnny Hosier's Lubrizol Beech E-18.

PAGE AIRWAYS, Rochester, N. Y., has a realignment of officials—J. P. Wilmot is chairman, G. G. (Tiny) Wilmot is president; J. L. Wilmot is secretary-treasurer; Douglas Juston is vice president-sales; C. G. Wright, vice president-military sales; E. R. Tharp, vice president-controller, and James E. Hanretta, former maintenance superintendent for Mohawk Airlines, is new operations director.

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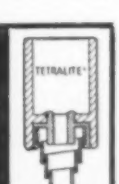

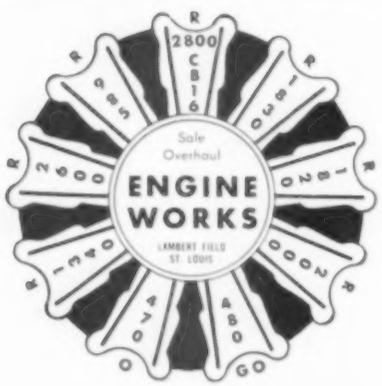

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